SOUTHERN POWER AND INDUSTRY

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MARCH, 1953

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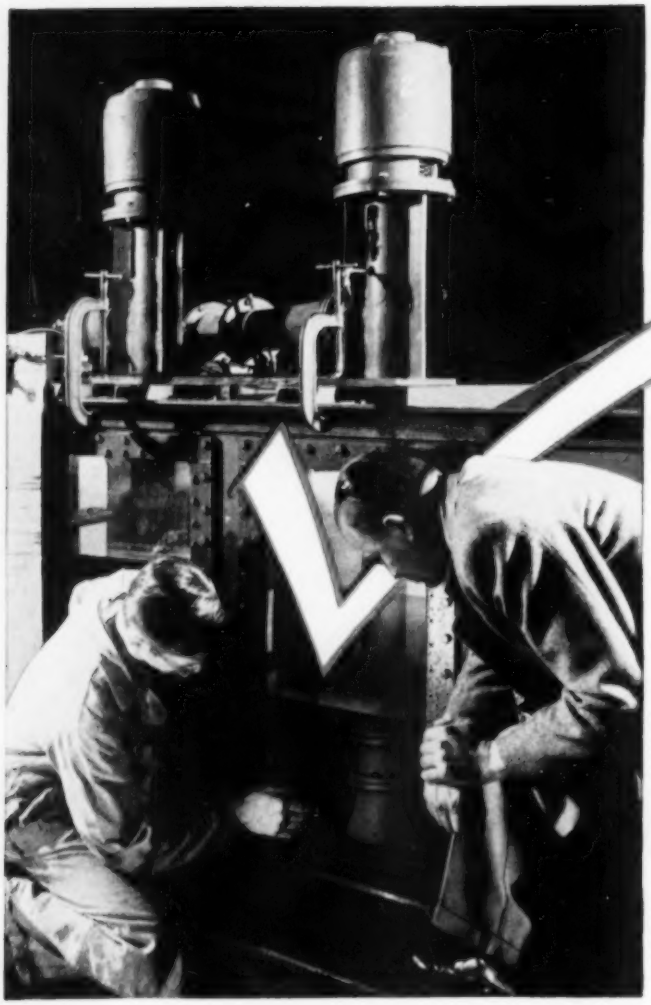

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Suction Bay and Pump Performance in Advance

Use this Allis-Chalmers pump laboratory to duplicate your suction bay design and operating conditions.

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The Allis-Chalmers pump laboratory is located at the West Allis, Wisconsin, Works and is available for use for all power plant operators and consulting engineers with large pump and water supply problems. For details of the services available, call your Allis-Chalmers District Office or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-3973

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Volume 71 Number 3

If you use water industrially (or industriously):
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for up-to-date help with your job
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*Few men interested in water technology and practices have time or opportunity to read all the published articles and technical papers which deal with the industrial aspects of water treatment and use. To help overcome this difficulty, Nalco Water Techs will provide a listing of carefully selected articles and papers which are reprinted by Nalco in pamphlet form for free distribution upon request by interested readers. Your requests will involve no obligation whatever . . . This addition to Nalco advertising is being undertaken solely as a further Nalco contribution to the better understanding and use of modern water technology.
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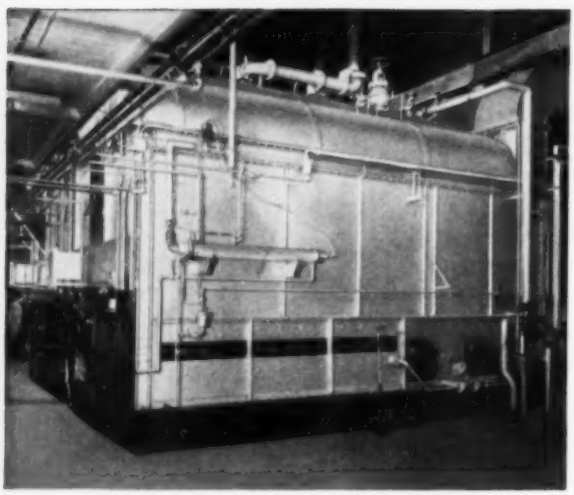
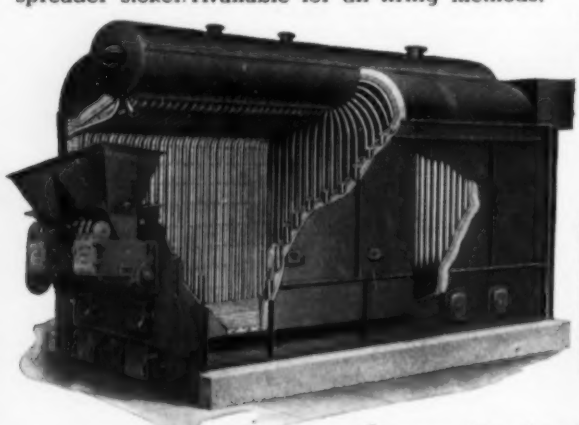
3 Erie City VL's Pay Off in 18 Months at Kaiser-Frazer



Above: Battery of 3 Erie City "VL's"—oil and gas fired—that replaced 7 obsolete coal fired units at a Detroit plant of Kaiser-Frazer Corporation.

Below: Sectional view of standard factory-assembled Erie City "VL" boiler with Erie City spreader stoker. Available for all firing methods.



Before modernization of the E. Jefferson Avenue Detroit plant of Kaiser-Frazer, seven coal fired boilers dating from 1911 and 1920 were in service. The new power plant consists of 3—20,000 pounds per hour Erie City "VL's" for oil and gas firing. They supply steam for heating and process.

While the cost of steam, using coal, would be about 5 cents less per thousand pounds, the use of oil and gas reduced capital investment due to the elimination of new coal storage and allied equipment. Average boiler efficiency of the 3 new Erie City "VL" boilers is 81.5%. Power house labor was reduced from 14 to 6 men. The combined savings from greater efficiency, minimum maintenance and reduced labor costs is expected to pay for the new boiler installation in 18 months.

Are you wasting fuel dollars with worn out boilers? Let Erie City Engineers recommend steam generators that will pay for themselves out of savings.

20 Page Catalog describing Erie City "VL's" in detail shows its easy adaptability to all firing methods and illustrates its superior design features. "VL's" are factory assembled to 300 hp. and field erected in larger sizes. Ask for Bulletin SB-43.

You can depend on Erie City for sound engineering

ERIE CITY IRON WORKS • Erie, Pa.

STEAM GENERATORS • SUPERHEATERS • ECONOMIZERS • AIR PREHEATERS

UNDERFEED AND SPREADER STOKERS • PULVERIZERS

SOUTHERN POWER AND INDUSTRY

MARCH 1953

Vol. 71 No. 3

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Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

March, 1953

► TENNESSEE NEWSPRINT MILL -- Bowaters Southern Paper Corporation's mill at Calhoun, Tennessee, scheduled for operation in '54, will make 125,000 tons of newsprint and 50,000 tons of kraft pulp per year. Plant will employ 800 workers and several hundred more will be needed to provide pulpwood.

Chemicals used daily will include: 20 tons of salt cake, 10 tons of caustic, 8 to 18 tons of chlorine, 16 tons of lime, 66,000 gallons of 36 Baume alum, and appreciable quantities of sulphuric acid. Engineering features of the power and process steam generation equipment are featured in this issue of SP&I.

► THE ARC DRILLING PROCESS may have possibilities in your plant. Cutting or drilling action of the Elox Electron Drill is accomplished by creating a series of electric arcs which disintegrate the hardest metals. In addition to removing broken taps and drills, studs and reamers, etc., the unit will cut holes as small as .030" and is adjustable for finishes ranging from coarse, fine, extra fine and super fine.

It will cut or drill any metal of nearly any hardness. Will also cut odd shaped cavities (square, hex, crescent) or any shape desired. It uses inexpensive electrodes, most sizes costing less than 3 cents per inch. One inch of electrode will drill one inch of tool steel.

► NEW BELT CONVEYOR IDLER, described in the New Equipment and Supplies section of this issue (page 8) is designed to save grease, labor and belts. The Industrial Division of the Continental Gin Company accomplishes this through pre-lubricated sealed units incorporating Timken bearings and Garlock Klozures.

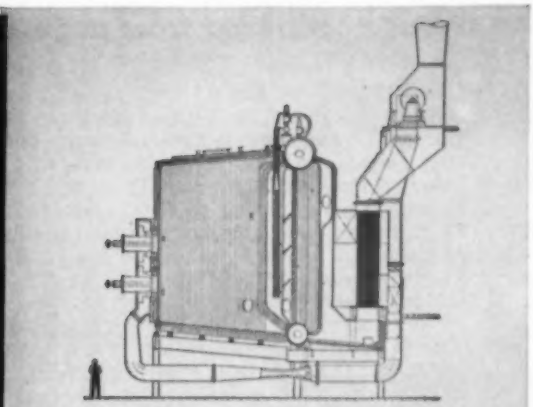
► NEW $10 MILLION LUMBER MILL of the Kirby Lumber Corporation, now under construction at Silsbee, Texas, will be one of the most modern in the South -- 18 buildings, 10 miles of railroad trackage, occupying 250 acres, and employing over 600. H. E. Bovay, Jr., Consulting Engineers of Houston, Texas, designed the new mill.

Nearly $1 million worth of electrical equipment will be supplied by Westinghouse: two 3500 kw condensing automatic extracting turbine generators operating at 3600 rpm, switchgear, power centers, electric log carriage drives, gearmotor drives for conveyors, and lighting fixtures.

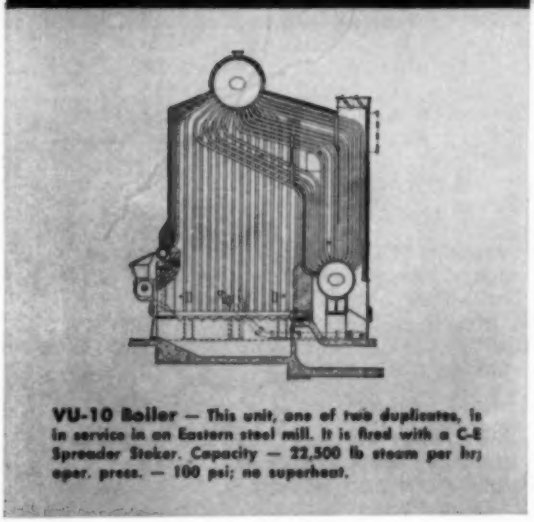
Four log carriages will be driven by d-c motors through gear units, and d-c will be supplied for each drive by 400 hp motor generator sets. Although weight of a carriage plus log will run up to 39,500 lb, smooth, rapid operation will be obtained by the use of magnetic amplifier regulators. A master controller will put control of carriage speed literally at the sawyer's fingertips.

(Continued on page 6)

VU-50 Boiler — This unit, one of five duplicates, serves a large tube mill. Designed to burn pulverized coal and blast furnace gas. Capacity — 175,000 lb steam per hr; oper. press. — 850 psi; steam temp. — 750 F.



VU-50 Boiler — This unit, one of five duplicates, is at a Midwestern steel plant. Designed to burn blast furnace gas and coke oven gas. Capacity — 100,000 lb steam per hr; oper. press. — 425 psi; steam temp. 700 F.



VU-10 Boiler — This unit, one of two duplicates, is in service in an Eastern steel mill. It is fired with a C-E Spreader Stoker. Capacity — 22,500 lb steam per hr; oper. press. — 100 psi; no superheat.

Leading Metal Producers using VU units in one or more plants

Aluminum Company of Canada, Ltd.
Anaconda Wire & Cable Co.
Bethlehem Steel Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
Cia. Siderurgica Nacional
Great Lakes Steel Corp.
Jones & Laughlin Steel Corp.
National Tube Co.
Phelps Dodge Corp.
Pittsburgh Steel Co.
Republic Steel Corp.
Revere Copper and Brass Inc.
Sloss-Sheffield Steel & Iron Co.

Industry Leaders select VU

One significant fact about the C-E Vertical-Unit Boiler is its wide acceptance by leading companies in practically every industry. This is so important to *all* companies because buying decisions of the larger manufacturers are often a practical guide for everyone right down the line.

Primary metal producers are an outstanding example. The reliability of their steam generating equipment is of utmost importance, since steam failure may cause extensive damage to costly equipment. It is especially significant then that many of the world's largest metal producers, each guided by its own investigations and conclusions, reached a common decision as to the merits of Vertical-Unit Boilers.

These companies have *proved* their satisfaction with VU Units by buying them again and again. One company purchased three in 1940 . . . three more in 1946 . . . five in 1949 . . . and two in 1951 — *thirteen units in eleven years.* In fact, the fourteen companies listed here have bought a total of 69 Vertical-Unit Boilers.

You can profit from the example of the primary metal industry — or from any industry where steam is exceptionally important. You will find — as so many others have found — that the C-E Vertical-Unit Boiler means lower steam costs through advanced design . . . sound construction . . . proved reliability. If you need steam — from 10,000 to 350,000 pounds per hour — take a tip from the leaders — investigate VU.

COMBUSTION ENGINEERING—SUPERHEATER, INC.

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.

B-625A

ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS AND AIR HEATERS

facts and trends *(continued from page 4)*

► TOPS IN MOTORS -- two 83,000 hp and two 25,000 hp motors, installed in tandem fashion, will be used in the supersonic wind tunnels at the Arnold Engineering Development Center at Tullahoma, Tenn. The Westinghouse 83,000 hp motors will stand 21½ ft high and weigh 225 tons. Their 122 ton rotors will turn at 600 rpm.
In addition to the 216,000 hp four-motor drive, the rotating machine will have five compressors. Blades for the latter measure 2 ft across the face, and 6 ft long, and will be mounted on a spindle 18 ft in diameter. Blades (solid forgings) weigh nearly two-thirds of a ton each.

► NEW 165,000 KW GENERATING UNIT is expected to be ready for service in 1956 on the Dallas Power & Light Company system. It, alone, will have a greater capability than all of the company's turbine generators combined as late as 1948. When current expansion programs are completed (including the above unit) the Dallas Power & Light Company will have a combined generating capability of 762,000 kw. This compares with 320,000 kw at the present time.

► LEASE MATERIALS HANDLING EQUIPMENT instead of buying emphasizes the Yale & Towne Manufacturing Company and the C.I.T. Corporation. A new plan enables industrial plants, etc., to obtain Yale industrial lift and fork trucks and allied equipment by paying monthly rentals as the machines are used. Leasing agreements are negotiated by Yale & Towne's field sales organization to help many companies meet expanding production and service requirements while avoiding the substantial capital investment required to purchase materials handling equipment.

► A NEW BLOWDOWN VALVE is claimed to offer substantial savings in operating efficiency, labor, and maintenance downtime. The Rice designed unit causes repeated disturbance of boiler water, preventing water crystal growth and formation of the scale and residue that normally build up insulation against the primary fuel. It is permanently attached to the blowdown outlet of the boiler and equipped with an automatic cycle-timer.

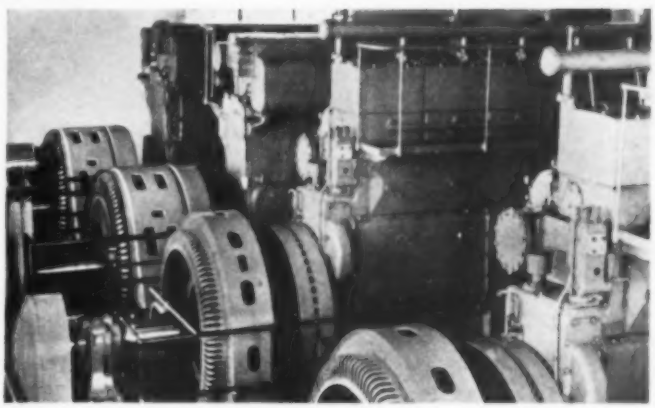
► POWDER-ACTUATED FASTENING TOOLS are finding increasingly wide acceptance in plant construction and modernization work. Tools employ a powder-actuated charge to drive studs, pins and screws into steel, wood or concrete. The tools permit as many as three or more fastenings a minute to be driven.
The Joint Industry Board of the Electrical Industry (management-labor group) in one large city has approved their use on all electrical construction jobs. Panel boxes, hangers, fixtures, etc., are installed with maximum efficiency.

► NEW BUILDING PROCEDURES -- soil stabilization by mechanical compacting and erecting concrete structures by use of hydraulically operated forms. The first large plant in the United States to be constructed on sand compacted by vibroflotation will be completed early this year at Bonnie, Florida. (Engineering details in this issue.) At another location, high concrete piers were being poured by conventional methods in 3½ weeks. Changing to the new method (continuous lifting of forms and continuous pouring) reduced the time to 3½ days.

► SHOP MAINTENANCE MEN -- Watch for SP&I's big 7th ANNUAL MAINTENANCE ISSUE in May, featuring ideas, kinks, and procedures to reduce maintenance cost, save materials, and improve operation. Tools, devices, equipment and supplies which maintenance crews employ ON THE JOB will be featured plus "plant-tested" maintenance procedures on buildings, piping and valves, refrigeration equipment, engines, pumps, compressors, etc.

Write the editors for additional information on any of the above items. SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 5, Ga.

"12,000 H.P. Hours per Gallon with Sinclair RUBILENE"



... says Leo D. Bradley, Manager
Western Michigan Electric Co-operative, Scottville, Michigan

"Our two Cooper Bessemer super-charged 1600 H.P. Model LS8T diesels deliver over 12,000 H.P. Hours per gallon of Sinclair RUBILENE H.D. Oil consumed," says Leo D. Bradley.

"We give much of the credit to the quality of this oil," continues Mr. Bradley. "RUBILENE® keeps our diesels exceptionally clean. Wear is kept at a minimum – the result is high efficiency ... low operating costs ... and low maintenance cost."

Sinclair Products have been used since the generating station first went into operation – 12 years ago. The recommendations made by a Sinclair Lubrication Engineer at that time plus continuous counseling service and superior Sinclair Products have meant substantial savings for this co-operative.

Perhaps a Sinclair Lubrication Engineer can help solve some of your lubrication problems. Phone your local Sinclair Representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR DIESEL LUBRICANTS
prolong engine life

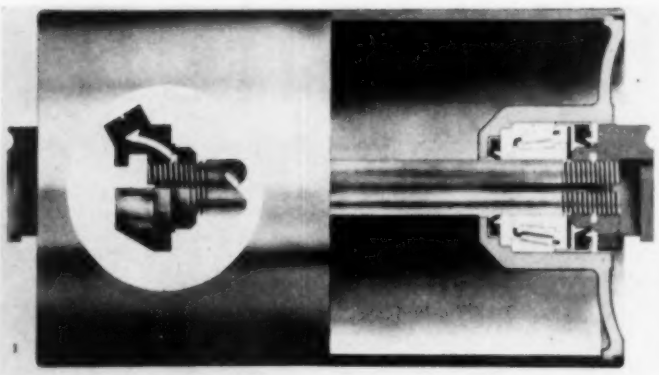
NEW EQUIPMENT and SUPPLIES for the Plant Engineer and Operating Force

New UST Belt Conveyor Idler; Unit-Sealed & Pre-Lubricated

D-1 THE INDUSTRIAL DIVISION, CONTINENTAL GIN COMPANY, Birmingham, Alabama, is producing and marketing the UST Continental Idler—a new type unit — sealed, pre-lubricated Timken bearing belt conveyor idler designed to operate for extended periods of time without relubrication.

New idler has been designed to save grease, labor and belts. This is accomplished through pre-lubricated sealed units incorporating Timken bearings and Garlock Klozures.

Unit bearing assemblies provide an ample but not excessive grease reservoir. This affects a saving on grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. Lubricant is a top quality water repellent grease of a stable consistency with a wide temperature range for long life. The unit bearing assemblies "sealed unto themselves" prolong belt life by prevention of grease migration through seals onto the belts.

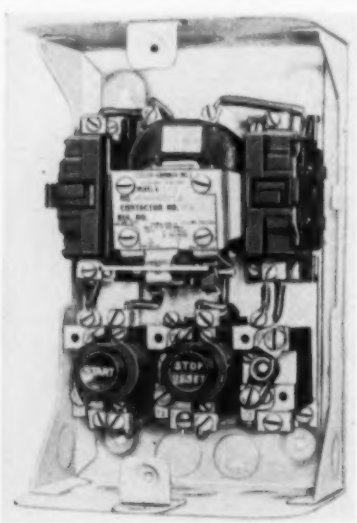


New idler design by The Industrial Division, Continental Gin Company, incorporates Timken bearings and Garlock Klozures. Full design and operating details available in Bulletin 116.

New idler unit is so designed that prior to lubricant reaching a point of deterioration the "UST" idler may be simply relubricated; or dis-assembled, cleaned, re-lubricated, and reassembled for another extended period of time. This construction permits operation of the idler without re-lubrication for one, two, three or more years, depending upon the severity or character of conditions.

Magnetic Starters, Contactors and Relays

D-2 CUTLER-HAMMER, INC., 312 N. 12th Street, Milwaukee 1, Wisconsin, has announced a new line of magnetic starters, contactors and relays, which incorporates a simple 5 unit construction designed to install easier, work better, last longer.



The new Cutler-Hammer NEMA Size O Starter — wrap-around cover has been removed.

A wrap-around cover pulls off, fully exposing the front and both sides of the unit for 180 degree accessibility. The 5 independent parts consist of 2 contact blocks, a magnet coil, an armature and a 3-coil or 2-coil overload relay mounted on a steel panel. Each part can be removed from the front without disturbing another part.

The new line features a 3-coil, adjustable overload relay permitting 4 ratings from each heater coil by changing its position. This adjustability provides protection within 3 per cent of full load motor rating. The 3-coil overload offers better protection against single phasing where unbalanced or unstable line conditions may occur.

The double break contacts can be inspected by pulling off a snap-on cover; the contacts can be removed without tools. The complete contact block can be removed by loosening 2 screws; the overload relay by turning out 2 screws. The armature, which pivots on rolling bearings, and the magnet coil may be replaced easily without tools. The complete panel, with all units assembled, can be taken out of the metal case by loosening 3 screws.

Free additional information is available to readers of SP&I. Circle the item code number on one of the reader service post cards provided on page 17-18.

Four Testing Ranges in V. A. O. Tester

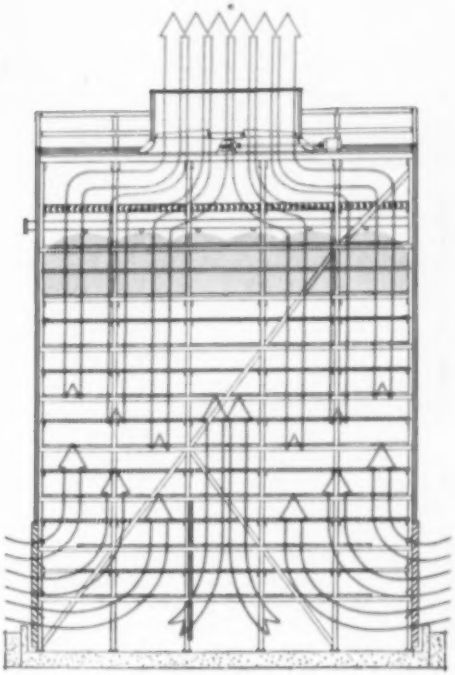
D-3 MARTINDALE ELECTRIC CO., 1334 Hird Ave., Cleveland 7, Ohio, has announced the new Model 52 V.A.O. Tester with four testing ranges: volts, a-c and d-c; 0-10, 0-50, 0-250, 0-1000, a-c only:

(Continued on page 10)

Efficiency of FLUOR COUNTERFLO Cooling Towers begins at the top

Heavy stainless steel fan blades are finely balanced, resist corrosion and are mounted on shafts whose exceptionally high fatigue strength has been substantiated by strain gauge tests and actual use. Pitch is adjustable to efficiently handle required air volumes at minimum tip speeds and horsepower requirements – more air per kilowatt. Speed reducers incorporating spiral bevel gears feature oil-bath lubrication and dry-air breather. The low-speed fan shaft is mounted on special steep angle thrust with radial bearings to take the combined gear thrust, fan thrust and weight of fan assembly. Driving mechanisms are built for hard-wearing, maintenance-free performance and for smooth, quiet operation.

Vibration Cut-out switches, exclusive with Fluor Cooling Towers, are an emergency safety device that stops the motor should excessive vibration accidentally occur, preventing possible damage to the tower or mechanical equipment. Design employing internal gusset plates duplicates that used in wooden bridge construction. These connectors add greater tensile and compressive strength to structural members, lower the total weight of towers, require less erection time and materially increase tower life. Sloping grid decks of rough-finished redwood with minimum one-inch dimension are used as scaffolding during erection and provide maximum deck surface with negligible air pressure drop through the tower.



Air distribution is controlled at every stage of its travel through the tower. Louver height is designed to obtain the desired intake velocity and wind-deflectors inside the tower uniformly direct air currents to all areas. Approach to the desired wet-bulb temperature is easily accomplished and performance to customer's specifications is guaranteed in every case.

Only Fluor Counterflo Cooling Towers are completely prefabricated. All cutting, drilling, and nailing is performed at the factory and tower parts are "packaged" for rapid delivery, marked for orderly assembly. More efficient control of the quality of straight-grained heart of California redwood and excellent workmanship in Fluor towers are maintained through prefabrication. Inexperienced craftsmen and laborers under Fluor's supervision can erect a Fluor tower in a minimum of time and at considerable savings in erection costs. Prefabrication means standardization; parts that may become worn or damaged over the years may be replaced economically. Uniformity of appearance as well as performance is assured.

BE SURE WITH **FLUOR**

THE FLUOR CORPORATION, LTD.
LOS ANGELES 22, CALIFORNIA

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FLUOR OF CANADA-TORONTO
FLUOR INTERNATIONAL-BEIRUT
READ WRIGHTSON-LONDON

ENGINEERS
CONSTRUCTORS
MANUFACTURERS

NEW YORK
CHICAGO
BOSTON
PITTSBURGH
SAN FRANCISCO
HOUSTON
BIRMINGHAM
TULSA

0-2.5; amperes, d-c only: 0-10; ohms: 0-1000, 0-10000; megohms: 0-1, 0-100.

A selector switch provides four positions: volts a-c, volts d-c, ohms, amperes. The range switch has 5 positions which provide for the above 5 voltage ranges, 4 ohm ranges, and 1 ampere range. Two pairs of sockets for plugging in test leads are clearly marked; test leads are 4 ft long and furnished with both prods and alligator clips.

Liquid Belt Lubricant

D-4 ALEXANDER BROTHERS BELTING COMPANY, Philadelphia, Pa., has recently placed on the market its new spray type liquid belt lube.

Packaged in pressure cans, the lubricant is released in a fine mist by simply pressing the nozzle with the finger. The product revitalizes leather, rubber or fabric transmission belts—restoring flexibility, prolonging life and stopping slippage. It is economical because there is no waste. It is convenient, clean and safe to apply.

Because of the small, easy-to-use size of the new container, the manufacturer recommends that users keep a can handy to each drive for frequent use. Best results are obtained by using sparingly and frequently. It is sold by industrial distributors in single 12-ounce cans or in cases of 12 cans each.

Torque-Limiting Wrench Has Automatic Release

D-5 PLOMB TOOL COMPANY, Box 3516 Terminal Annex, Los Angeles, Calif., has developed a precision torque-limiting wrench without the usual external indicating devices, and suited for nut and bolt torquing by almost all types of industries.

Ratchet head and plain head models of the Proto torque-limiting wrench.

The new wrench differs from most conventional types in four basic respects. It is a torque-limiting device (releases automatically at proper setting), and not a torque-indicating device (requiring dials, pointers, scales, sound indicators, etc.) It employs a fully enclosed precision spring under compression as the principal torque-controlling element. It uses an accurate micrometer-type adjustment. Models with a built-in reversible ratchet head are available that do the work of both a ratchet and torque wrench.

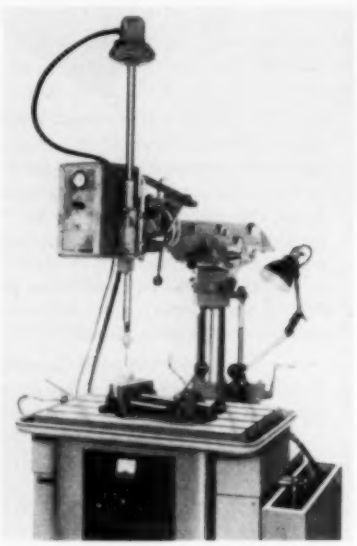
Desired torque is set by turning the handle, just like a micrometer. When the right torque is reached by pulling the handle, the wrench releases automatically and signals the operator with a positive reflex action. Upon removal of hand pressure, the torquer resets automatically for the next operation.

Electron Drill Removes Broken Taps and Drills

D-6 ELOX CORPORATION OF MICHIGAN, 740 N. Rochester Rd., Clawson, Michigan, originators of the "arc drilling" process, announces the addition of the M-300 to their present line of Elox Electron Drills.

Unit accomplishes its cutting or drilling action electrically by creating a series of electric arcs which disintegrate the hardest metals. In addition to removing broken taps and drills, studs, reamers, etc., the new M-300 will cut holes as small as .030" and is adjustable for finishes ranging from coarse, fine, extra fine and super fine.

It will cut or drill any metal of any hardness or thickness from magnesium to diamond hard steel. Manufacturer emphasizes that it will also cut odd shaped cavities such as square, hex, cresent, or any shape desired. It uses inexpensive electrodes, most sizes costing less than 3 cents per inch. One inch of electrode will drill one inch of tool steel.



The Elox Electron Drill comes complete with an automatic power feed, which allows continuous operation. If a particle of metal should create a short in drilling, the power feed will back out and clear itself. This eliminates the possibility of the short welding the electrode to the work.

Industrial Fan Design

D-7 HUNTER FAN AND VENTILATING CO., 400 South Front St., Memphis 2, Tenn., has developed a low-cost industrial fan en-

New Equipment and Supplies Continued on page 88

Only Powermaster guarantees 83%!

The "pay-off" on a boiler is its operating efficiency!

Take a look at this typical efficiency curve of POWERMASTER . . . then compare A.S.M.E. tests with those of any other boiler! At less than full load (which is normal in field operation) notice that POWERMASTER efficiency actually *increases*.

There's a reason for such efficiency. The POWERMASTER is the development of 68 years' experience in boiler manufacture. Continuing research and progressive engineering have consistently been reflected in POWERMASTER design:

- **FIRST to provide the Voriflow air-atomizing burner.**
- **FIRST to provide full modulating cam control.**
- **FIRST to provide immediate change-over from oil to gas firing.**
- **FIRST to provide a *complete* packaged unit.**

Point-by-point, POWERMASTER welcomes comparison. Before deciding on a new boiler for your plant, be sure to get the facts on the new POWERMASTER with VORIFLOW combustion. Just drop us a line and we'll be glad to send you complete information.

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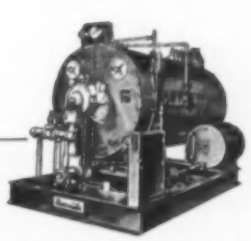
In sizes to 500 HP; pressures to 250 psi.



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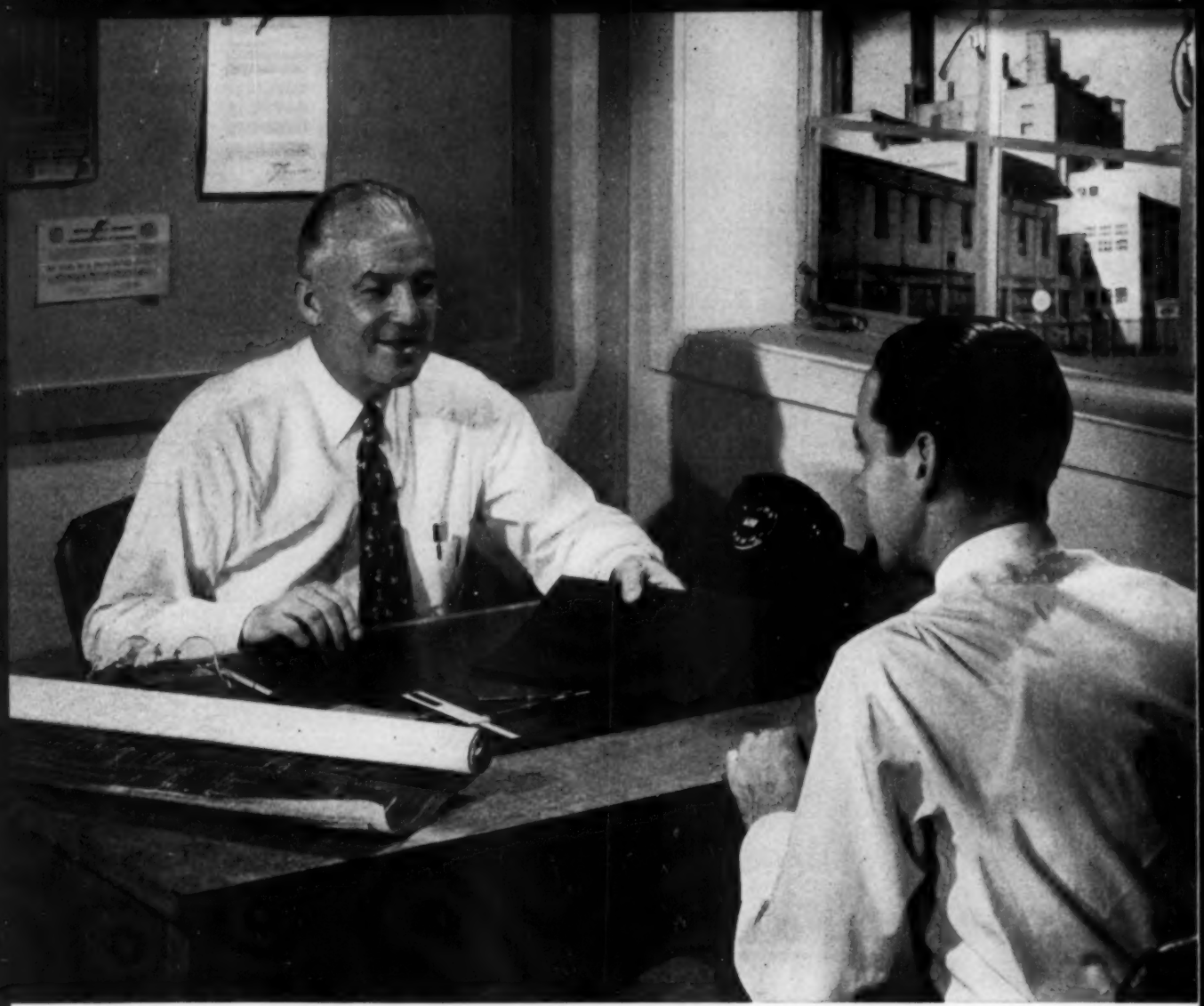


When you have a water conditioning problem—the first thing to do is call

cochrane

Whether your requirements are large or small, call a Cochrane Water Engineer. Supported by his recommendation, you'll be sure you're right.

. . . water conditioning is a problem for specialists. The Cochrane people specialize in water engineering and water conditioning equipment. And since Cochrane manufactures all types of water treating equipment their recommendations are unbiased. Cochrane engineers will show you how to obtain most economically the quality of water you want. Call Cochrane first when you have a water conditioning problem.

THERE'S A COCHRANE SOFTENING PROCESS TO GIVE YOU THE WATER YOU WANT

When you have a water softening problem—Cochrane Water Engineers can give you the right answer. Through many years of experience in all types of water treatment—including ion exchange—Cochrane offers five distinct processes, each with specific advantages for a particular job:

Hot Zeolite Process
Sodium Zeolite
Hydrogen Zeolite
Dealkalization
Demineralization

A Cochrane Water Engineer will be glad to explain the differences in these processes. He'll show you how the one process best suited to your requirements will provide water of the quality you want, cheaply and abundantly—from any raw water.

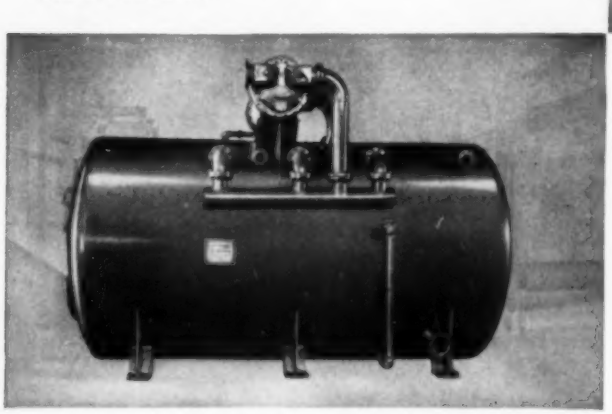
COMPLETE DEAERATION OF BOILER FEEDWATER

Cochrane provides all types of Deaerators to meet any requirements:

Tray-Type Deaerators
Atomizing Deaerators
Deaerating Hot Water Generators
Cold Water Deaerators

One of these units can be applied to your particular boiler feedwater requirements and built of materials suited to your service. A Cochrane Water Engineer will bring you the benefit of Cochrane's long experience in conditioning boiler feedwater.

Cochrane Zeolite Softener installed with a HYDROMATIC Single Control Valve.



Cochrane Tray-Type Deaerator for Central Station installation in the Southwest.

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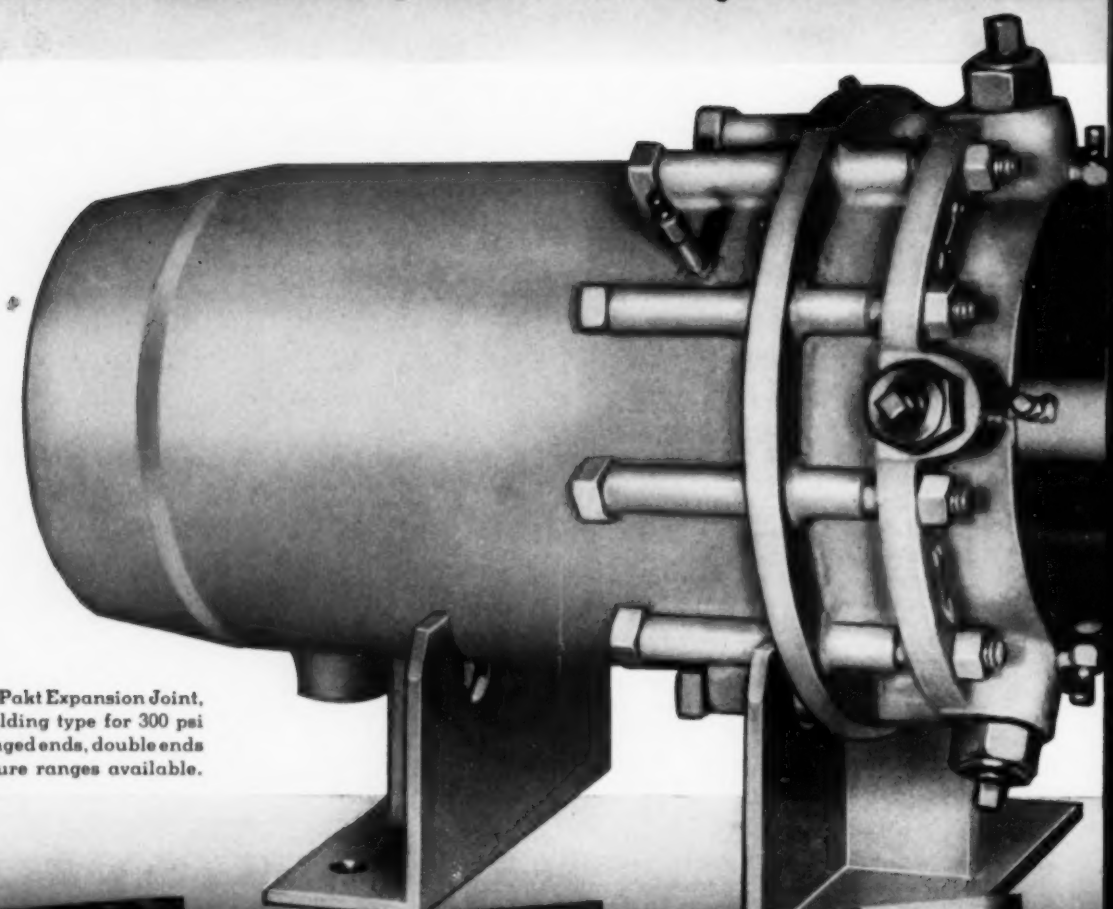
PHILADELPHIA ELECTRIC
GUN-PAKT EXPANSION JOINTS for



Yarway Gun-Pakt Expansion Joint, single end welding type for 300 psi pressure. Flanged ends, double ends and all pressure ranges available.

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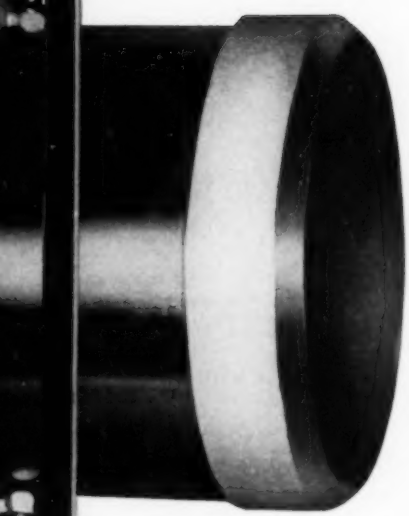
relies on 24" UNDERGROUND STEAM LINE



Philadelphia Electric Co. is one of many utilities, institutions and industrial plants who rely on Yarway Gun-Pakt Expansion Joints for steam distribution lines. As an example, twenty-four large 24" Gun-Pakt Joints are helping maintain PE's reputation for reliability, on their new 24" steam distribution line. Gun-Pakt Joints frequently are selected because of the following features.

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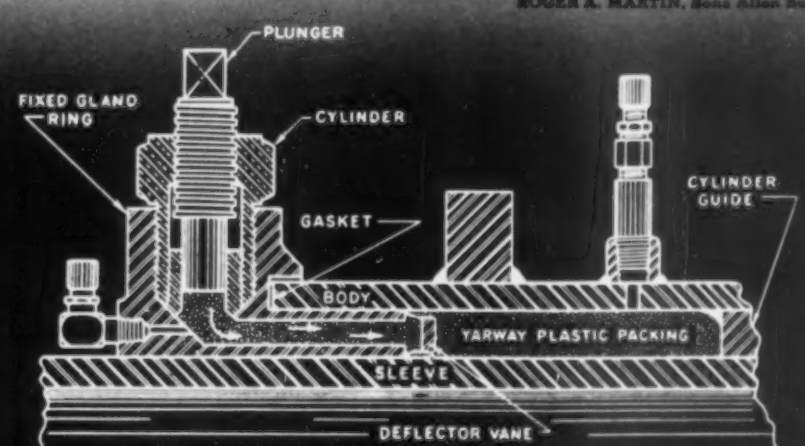

GUN-PAKT EXPANSION JOINT

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134	182	241	245	250	257	259	280	306	310	322	325	328	330	333	337
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B21	B22	B23	B24	B25	B26	B27	B28								

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ELECTRICAL

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Continued on page 127

3-53-3

Please send me without obligation, free booklets described in the March, 1953, issue of SOUTHERN POWER AND INDUSTRY as circled below:

6	7	20	30	31	34	48	57	59	66	78	81	84	108	119	120
134	182	241	245	250	257	259	280	306	310	322	325	328	330	333	337
346	352	371	401	403	432	448	450	462	465	469	476	521	522	529	567
584	608	621	623	645	662	706	734	739	757	758	784	804	810	831	833
907	922	928	956	984	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20
B21	B22	B23	B24	B25	B26	B27	B28								

Also send further information on following New Equipment (page 8)

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15

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Equipment and Review Editor
SOUTHERN POWER AND INDUSTRY
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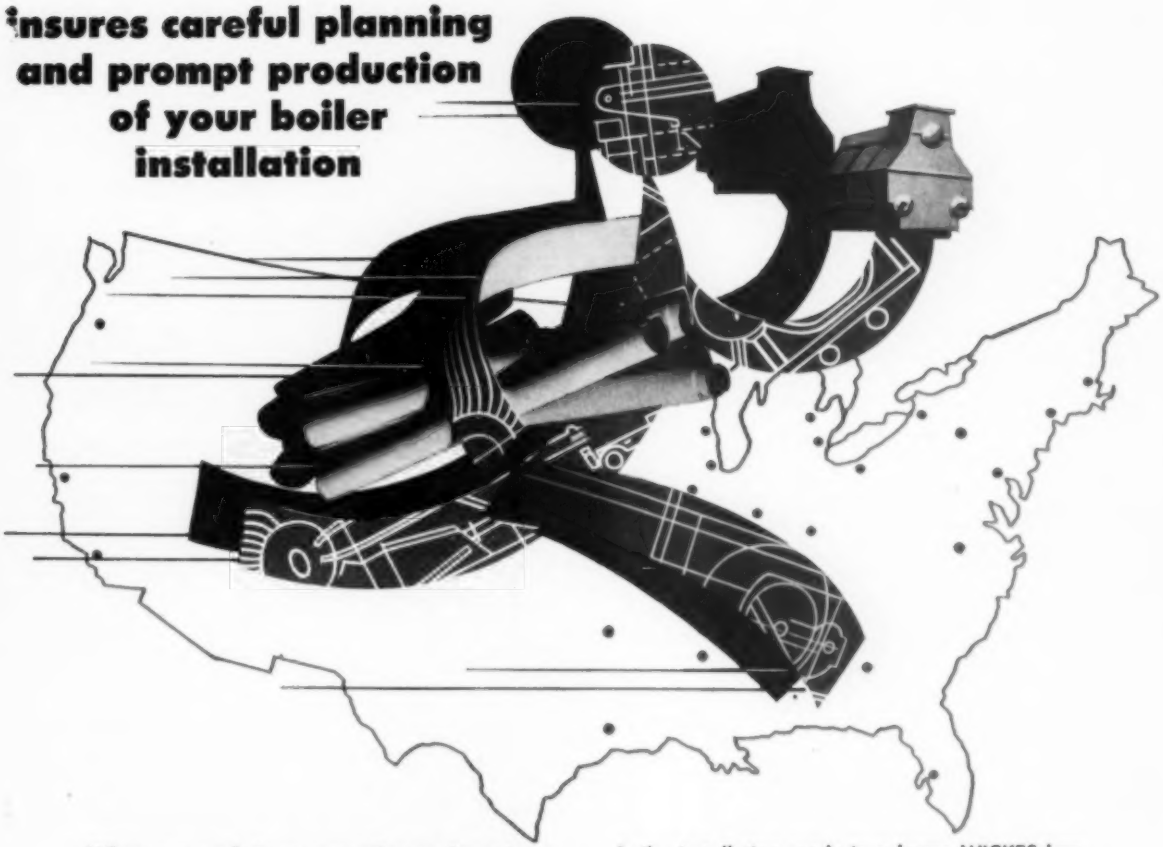
List Items You Want, Tear Out and Mail One of the Attached Cards Now!

Please be sure to fill in your Firm's Name and your position on the Coupon. This service cannot be extended to you unless this information is furnished.

WICKES SERVICE

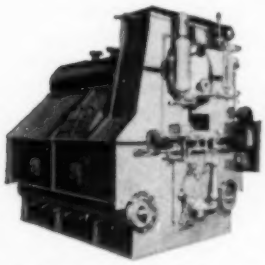
insures careful planning and prompt production of your boiler installation



When you need steam generating equipment, you want to be able to work out your requirements with experienced men who are near at hand and know boilers thoroughly. That's where WICKES can help you, because WICKES has factory-trained sales engineers in twenty-three principal cities in the United States and several industrial centers outside the country. These men are ready to help you plan your new boiler installation.

And when your plans are settled, you want your equipment installed as soon as possible. That's when WICKES engineers and production men swing into action. They rush to get your new boiler installation ready in a hurry. WICKES handles all the details—from the time the first drawings are made to the day you raise steam pressure. Then, for the life of the boiler, WICKES sales engineers and maintenance men are available day and night to keep your equipment operating at peak efficiency.

WICKES can fill your requirements for steam generators up to 250,000 lbs. per hour and 1000 psi.—all types of multiple drum boilers, adaptable to any standard method of firing. Write today for descriptive literature or consult your nearest WICKES representative.



WICKES

THE WICKES BOILER COMPANY

DIVISION OF THE WICKES CORPORATION, SAGINAW, MICHIGAN

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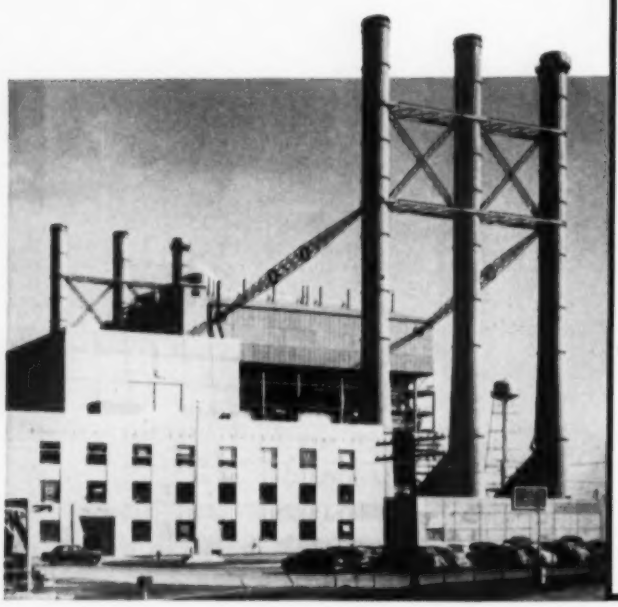
RECOGNIZED QUALITY SINCE 1854

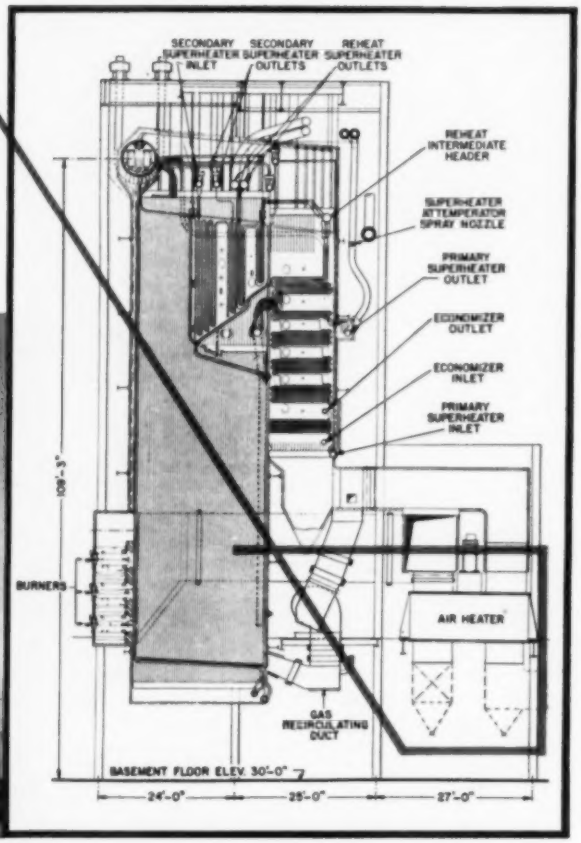
146

All Boilers at Moss Landing Steam Plant of the Pacific Gas and Electric Company

equipped with

LJUNGSTROM AIR PREHEATERS





In the country's largest single utility expansion program, costing more than one billion dollars, Pacific Gas and Electric Company is boosting its power capacity by more than 2,500,000 kilowatts. One of the five steam power plants in this program is P. G. and E.'s Moss Landing Steam Plant, designed and constructed by Stone & Webster Engineering Corporation, under the supervision of the P. G. and E. Engineering Department.

Three of a projected five 100,000-kw turbines are in operation now at Moss Landing. Steam for each of these three turbines is supplied by two 475,000 pounds of steam per hour Babcock & Wilcox Radiant Boilers with superheater outlet conditions of 1405 psi and 950 F. The two turbines yet to be installed will each be powered by one B&W reheat boiler (illustrated), designed to generate 850,000 lb of steam per hr at 1450 psi and 1000 F, reheated to 1000 F.

Each of the boilers at Moss Landing has been designed to incorporate a Ljungstrom Air Preheater. Those now in use preheat incoming air to 575 F, and cool exit gases to 350 F. Ljungstroms will be used also for the boilers being built.

Moss Landing is another in a long series of new stations and expansions to existing stations where Ljungstrom Air Preheaters have been specified for high-performance steam generating units. The unanimity with which the Ljungstrom has been accepted by boiler manufacturers, consulting engineers, and power companies is demonstrated by the fact that over 285,000,000 pounds per hour of steam capacity since 1945 has been served by Ljungstrom Air Preheaters.

THE Air Preheater Corporation 60 East 42nd St., New York 17, N. Y.

You've got a Winning Combination

A STANDARD ISA FACE-TO-FACE DIMENSIONS
K "FLOW-LINE" CONTOURED BODY
Q STELLITED SEATING SURFACES
J RENEWABLE SELF-ALIGNING GUIDES
10 SEAT RINGS EASILY REPLACED WITH VALVE IN PIPE LINE

with the New

TRADE **LESLIE** MARK

DOUBLE SEATED DIAPHRAGM CONTROL VALVES

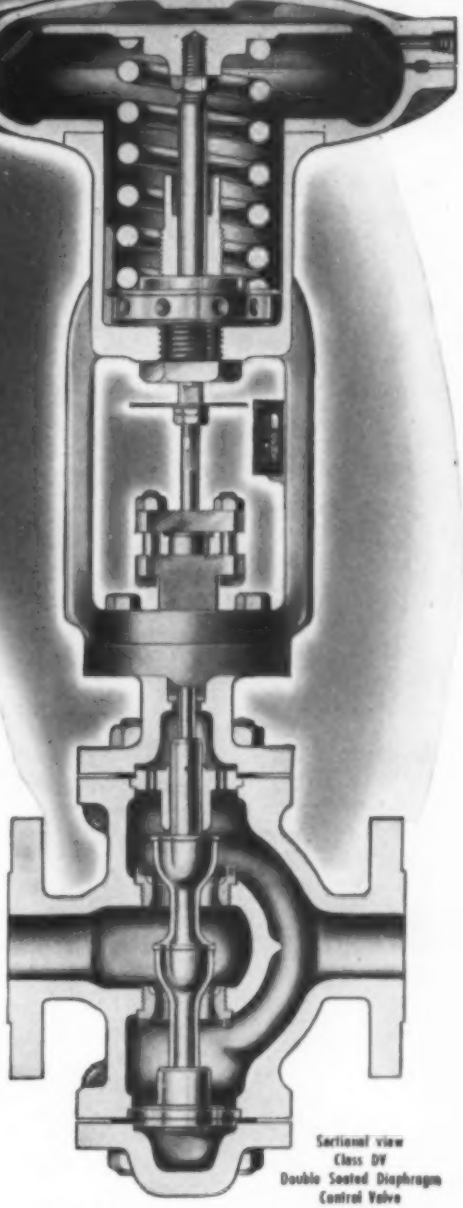
Calling a spade a spade you've got a "royal flush" of features in these new Valves designed for use with control instruments.

Their "Flow-Line" Contoured Bodies have ISA standard face-to-face dimensions and high capacity, low turbulence and minimum body pressure drop characteristics.

A new type, top and bottom guided construction is self-aligning and non-binding regardless of uneveness of bolt tightening.

Standard, integral stellited seating surfaces are recommended for steam service to reduce seat ring thread corrosion. Renewable, interchangeable seat rings also furnished where desired and may be easily replaced without removing valve body from the line. Elaborate grinding at high temperatures is completely eliminated.

With these Valves, you get as *standard equipment*, features heretofore only obtainable in expensive, specially designed valves.



Sectional view
Class DV
Double Seated Diaphragm
Control Valve

Look for LESLIE REGULATORS under "Valves" or "Regulators" in your classified telephone directory in the following cities where LESLIE factory trained engineers are located:

Albany, N. Y.	Chicago, Ill.	Galveston, Tex.	Memphis, Tenn.	Orlando, Fla.	Salt Lake City, Utah
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Beaumont, Tex.	Denver, Colo.	Kansas City, Mo.	Mobile, Ala.	Providence, R. I.	Syracuse, N. Y.
Birmingham, Ala.	Des Moines, Ia.	Kingsport, Tenn.	Monroe, La.	Richmond, Va.	Tucson, Ariz.
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***WRITE FOR* Bulletin 513**

ESTABLISHED 1900 **LESLIE CO.**

261 Grant Avenue, Lyndhurst, New Jersey

FLOATLESS LEVEL CONTROLS • PRESSURE REDUCING VALVES • PRESSURE CONTROLLERS
SELF CLEANING STRAINERS • PUMP GOVERNORS • TEMPERATURE REGULATORS
• AIR HORNS • STEAM WHISTLES

If CORROSION is a problem...

HOMESTEAD *Lever-Seald* VALVES

WILL *SOLVE* IT!

In leading chemical plants, refineries, paper mills, textile plants, steel mills and hundreds of other industries HOMESTEAD Lever-Seald Valves have virtually put an end to valve operating problems. Corrosive or viscous fluids, extremes of temperature or pressure or other adverse conditions that cause ordinary valves to stick or seize, simply cannot affect HOMESTEAD Lever-Seald VALVES. For built into each valve is a powerful lever-and-screw device that prevents sticking and assures positive action at all times, under all conditions in services ranging from 40° below zero to 1100° Fahrenheit.

HOMESTEAD Lever-Seald VALVES are available in straight-way, three-way, and four-way types, with screwed or flanged connections, in Semi-Steel, Steel, Ni-Resist, Stainless Steel, Monel or other alloys from 1″ to 12″, for vacuum to 1500 lbs. They are also furnished for pressure gun lubrication if desired.

If Corrosion . . . Temperature . . . Pressure . . . or fluid contamination is a problem, why not solve it by changing to HOMESTEAD Lever-Seald VALVES today.

Valve Reference Book No. 39 on Request.

HOMESTEAD VALVE MANUFACTURING CO.

"Serving Since 1892"

CORAOPOLIS, PA.

P. O. BOX 70

Better gear protection

*when you need it!**

—GULF E. P. LUBRICANTS

With Gulf E.P. Lubricants you get extra protection against gear troubles when production demands put shock loads on equipment. They are specially compounded to prevent metal-to-metal contact and help protect against pitting, spalling, and excessive wear.

For specific recommendations for your equipment, call in a Gulf Sales Engineer today. Write, wire, or phone your nearest Gulf office.

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation · Gulf Refining Company
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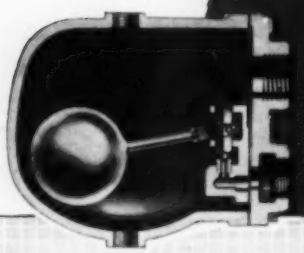
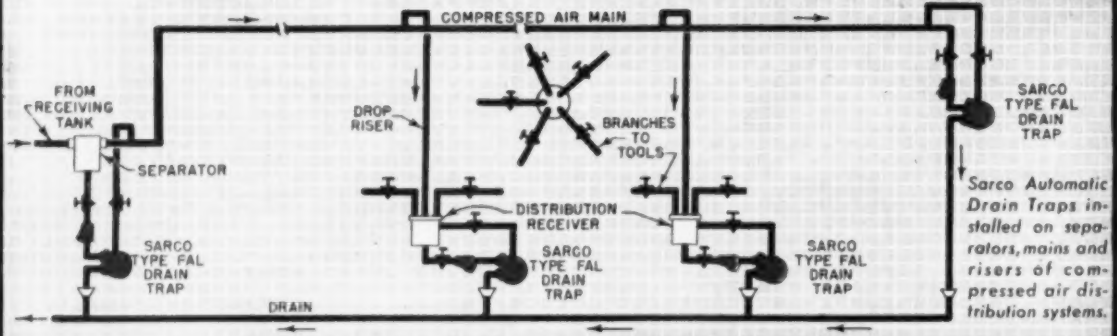
REMOVE WATER



Sarco Drain Trap type FA, sizes ¾" and 1", pressures to 750 psi. Floats, valve seats and discs are of stainless steel.

Series 52
No. 5



Sarco Automatic Drain Traps installed on separators, mains and risers of compressed air distribution systems.

...from compressed air

with SARCO automatic drain traps

MOISTURE condensing from compressed air in mains and distribution lines must be removed as soon as it collects. Otherwise there will be damage to tools, marred paint surfaces, or wetting of material to be cleaned, especially electrical machines and sand molds.

Water accumulating at the base of risers or low points in the lines may also cause water-hammer and trouble from freezing.

Sarco Drain Traps should be installed at the aftercooler, on separators, at the receiver and on low points in the lines, to remove water as quickly as it collects.

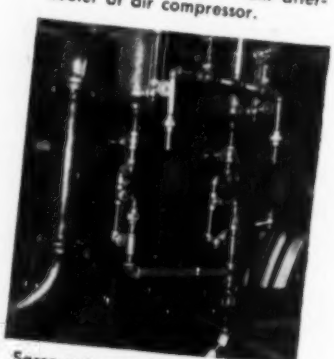
At nominal cost, these traps will greatly improve your compressed air operation.

Sarco Company, Inc., Empire State Bldg., New York 1, N.Y. Represented in principal cities. Sarco Canada Ltd., Toronto 8, Ont.

TECHNICAL BULLETIN NO. 5-CA
will help you get more work from your air compressors at less cost. Write for your copy.

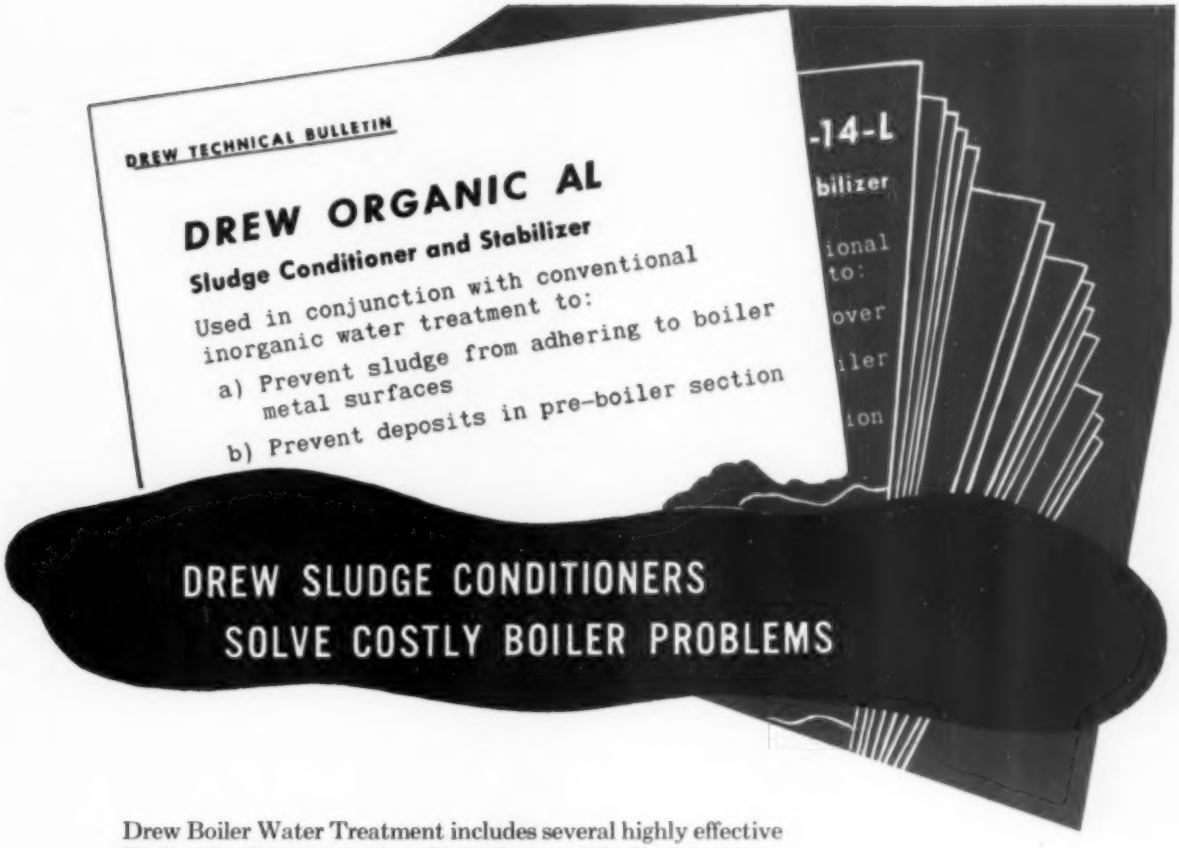
SARCO saves steam
improves product quality and output

Sarco type FA Drain Trap removing separated water from aftercooler of air compressor.



Sarco automatic Drain Traps, type FA, removing water from compressed air separators.

413



DREW SLUDGE CONDITIONERS SOLVE COSTLY BOILER PROBLEMS

Drew Boiler Water Treatment includes several highly effective Sludge Conditioners such as Drew Organic AL. Each has been developed to correct specific conditions in industrial water systems.

One major southeastern manufacturer was having difficulty with sludge and scaling in 13 boilers in 5 plants. Drew recommended a treatment of alkali, phosphate and Drew Sludge Conditioner AL. The entire system was cleaned up quickly and there has been no further trouble, costly maintenance or parts replacements.

To prevent or eliminate industrial water problems in your plant, you'll get results faster and more economically with this Drew program:

1. Thorough study and analysis of the problem
2. Use of effective organic and inorganic products
3. Efficient methods of feeding products to the system
4. Control of dosages by simplified plant testing
5. Service by qualified field engineers
6. Technical assistance by the Drew Technical Department

Write for booklet "Complete Boiler Water Conditioning" and technical bulletins.

Power Chemicals Division

E. F. DREW & CO., INC.

15 East 26th Street, New York 10, N. Y.

SAN FRANCISCO CHICAGO PHILADELPHIA BOSTON DALLAS ASHEVILLE, N. C.
AJAX, ONTARIO

Service throughout the United States, Canada and South America

DREW PRODUCTS

$12.65 on the shelf... $32.45 in the line

Like most installations, a pipe line is part materials and part labor. And the labor part has been getting bigger and bigger.

This growing labor cost is no small consideration when buying piping equipment. It costs just as much to install an inferior valve as a good one. And it costs a lot more to service the inferior one. For a single item, that difference might not be significant. But single items don't make a piping system. Instead, you may use and have to maintain hundreds, even thousands of individual valves.

Simple arithmetic tells why today it's more important than ever to buy valves that last longer and need fewer repairs. That's why Crane quality makes Crane the line for the thrifty buyer... it's why more Crane Valves are in use than any other make.

Crane Co., *General Offices:* 836 S. Michigan Ave., Chicago 5, Ill. *Branches and Wholesalers Serving All Industrial Areas.*

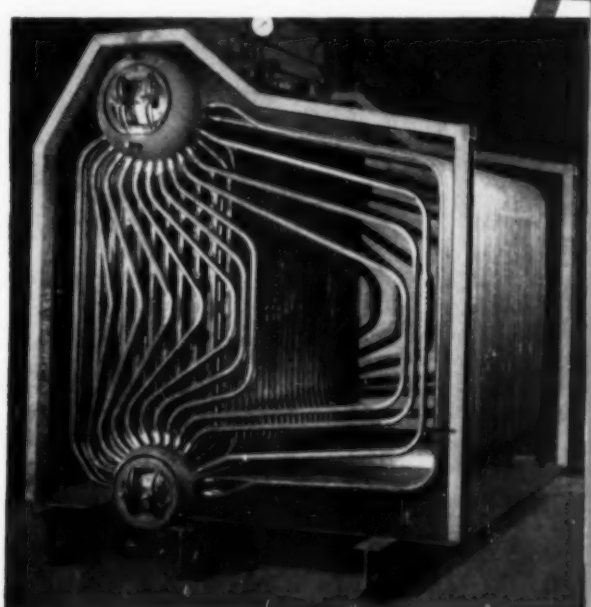
CRANE

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

Announcing

SPRINGFIELD
PACKAGE TYPE BOILERS

HERE is Springfield's new Package Type Boiler designed especially to meet many of today's requirements for steam and high temperature hot water in industry, power, and government projects. This new line has had the benefit of more than five years of field testing and development work. Boilers are now available in a range of sizes from 7,500 to 30,000 lbs. of steam per hour, or equivalent water ratings in B.T.U., and in design pressures of 200, 300, 600, and 900 psig. These units combine all the advantages of compact, standardized, portable package boilers with the high efficiency and rugged reliability of Springfield's water tube design. ***Let us give you complete information now.***



WATER COOLED FURNACE—Tangent water tubes completely shield full length combustion chamber. Long gas travel; low exit temperature.

INTEGRAL BENT TUBE DESIGN—No separate headers. Large water capacity gives generator exceptional ability to handle heavy peak and fluctuating loads.

DRY STEAM—Special purifier-type drum baffling insures high steam quality.

STEEL JACKETED, INSULATED—Shop tested for absolute gas tightness. Suitable for outdoor or indoor installation.

SHOP OR FIELD ASSEMBLY—Where necessitated by limited wall openings, Springfield's unique, insulated sectional casing and standardized sectional parts permit field assembly with minimum field labor.

OIL, GAS, OR COMBINATION FIRING—Can be furnished with complete burner and control assembly or boiler can be purchased separately, enabling user to select make and type of burners and controls desired in specification.

SPRINGFIELD BOILER CO.

1957 East Capitol Avenue • Springfield, Illinois

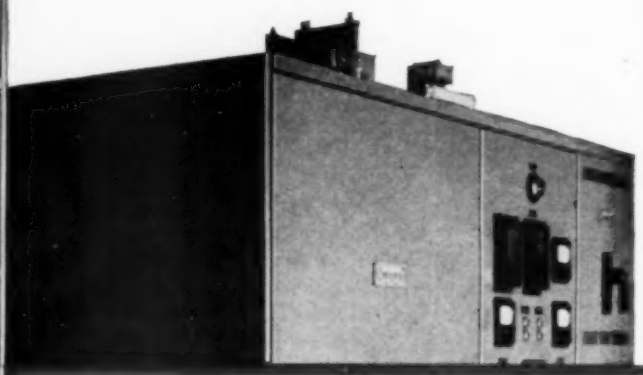
BENT TUBE BOILERS • STRAIGHT TUBE BOILERS • SUPERHEATERS
DESUPERHEATERS • AIR HEATERS • ECONOMIZERS • PACKAGE BOILERS

FOUNDED SPRINGFIELD BOILERS IN 1890

Built to Springfield Standard of Quality

The same incoming power

Fields Point Manufacturing Corporation increases production substantially with *high-efficiency* I-T-E Mechanical Rectifiers



I-T-E Mechanical Rectifiers are designed to convert ac to dc with *over-all* efficiency of 94% and higher.

This was the level of efficiency Fields Point's management wanted and expected from their I-T-E units. Each kilowatt of purchased power was to do maximum work in tons of chlorine output.

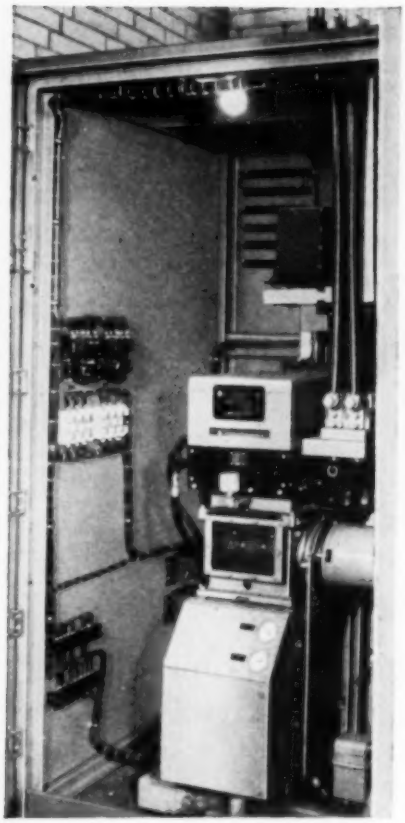
After five months of continuous mechanical-rectifier operation supplying d-c power to the electrolytic chlorine cell line in its Providence, R.I., plant, the company now reports production results. *10%* more chlorine has been produced—with the same power! The expected high efficiency has been realized!

This Fields Point experience adds to the growing testimony that I-T-E Mechanical Rectifiers live up to their promised high efficiency. Every one of 37 units now installed—totaling more than 200,000 amperes of connected load—helps prove the point.

D-C supply to the Fields Point bus is at 260 volts. Other installations give equally reliable evidence that system voltage can be any rating in the range from 50 to 400 volts—with 94% over-all efficiency or higher.

Two I-T-E Mechanical Rectifier units are shown as installed in the Providence plant of Fields Point Manufacturing Corporation. Daniel Townend, Fields Point's president, is adjusting a portable oscilloscope to let R. E. Murphy, I-T-E vice-president, observe d-c flow from the nearer unit.

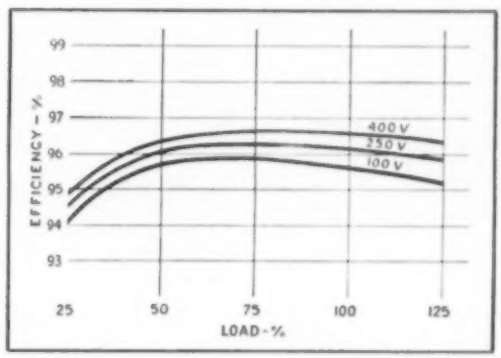
but 10% more chlorine!



One of the two contact mechanisms in the Fields Point installation of I-T-E Mechanical Rectifiers. Each Rectifier is a standard I-T-E unit with design rating of 5000 d-c amperes.

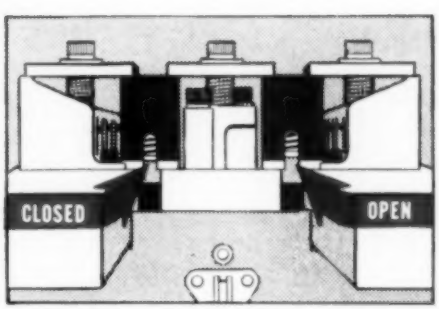
HIGH EFFICIENCY THROUGHOUT LOAD RANGE

During continuous operation at the Fields Point plant, load has remained at or very near 100%. Should load vary at any time to as low as 25% or up to 125%, over-all conversion efficiency will still be high. The EFFICIENCY curve below is characteristic of I-T-E Mechanical Rectifier performance, and represents a principal advantage: flexibility for plant production schedules while getting the most out of a-c power purchased.



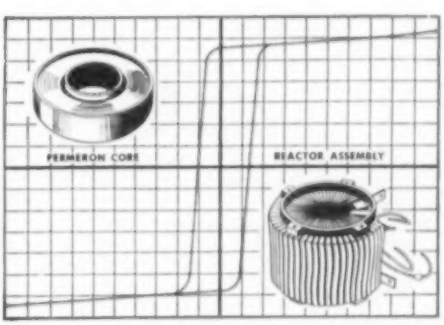
HERE'S WHY

Here are two basic reasons why I-T-E Mechanical Rectifier users get 94 kw (and more) of d-c power for every 100 kw of a-c power they buy:



Solid silver contacts held closed by powerful springs, give highest conductivity between a-c and d-c networks.

Sparkless low-loss commutation is obtained by interposing a Permeron*-core reactor between a-c supply and contact mechanism. This provides a brief period during which current in a contact is zero, allowing sufficient time for sparkless contact closing or opening.



**I-T-E's special saturable core material. Typical Permeron magnetization curve is shown above.*

Get the facts—If you are planning new or expanded a-c to d-c conversion facilities, it will pay you to investigate high-efficiency I-T-E Mechanical Rectifiers. They increase production or cut power bills in many kinds of applications—electrolytic chemical production, metal refining, motor load. Write for details.

BULLETIN 5106—covers theory, design, construction, standard arrangements.

BULLETIN 5204—gives details of I-T-E's special magnetic core material, *Permeron*.

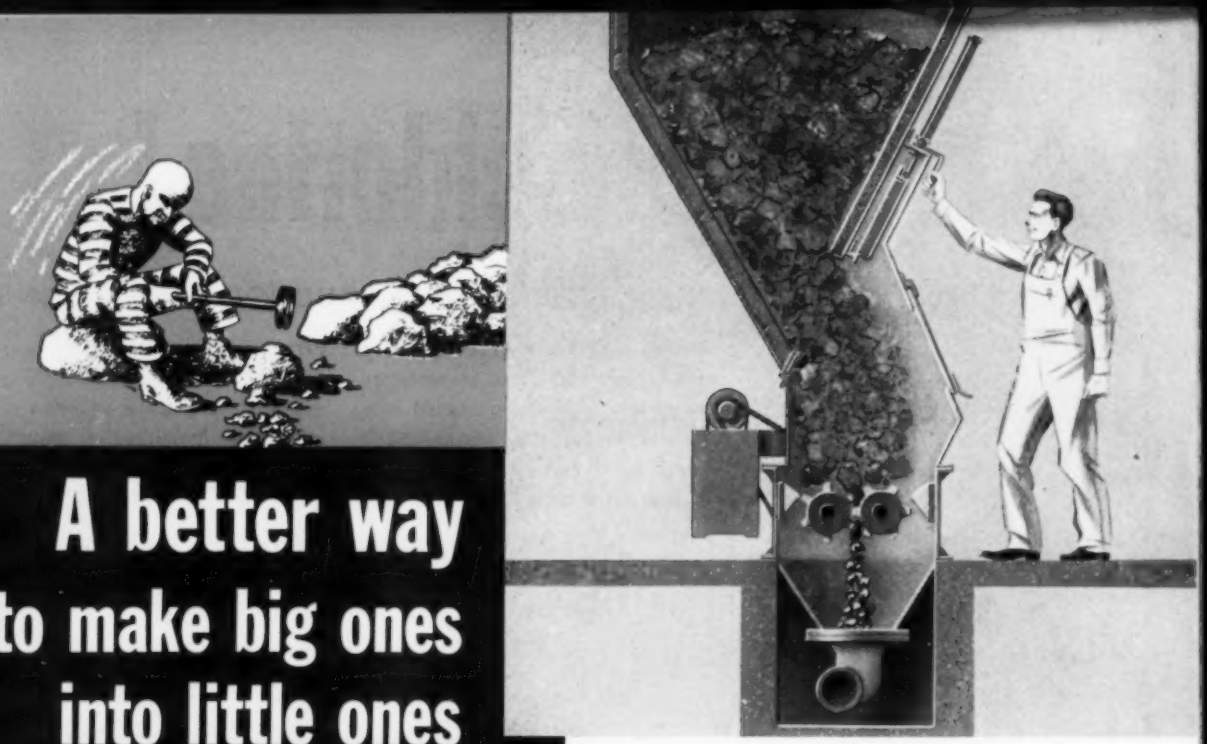
BULLETIN 5205—presents engineering explanation of high efficiency provided by I-T-E Mechanical Rectifiers.

I-T-E

MECHANICAL RECTIFIERS

I-T-E CIRCUIT BREAKER CO.•Rectifier Division•19th and Hamilton Streets, Philadelphia 30, Pa.

EPD—Canadian Mfg. and Sales: Eastern Power Devices, Ltd. Toronto



A better way to make big ones into little ones

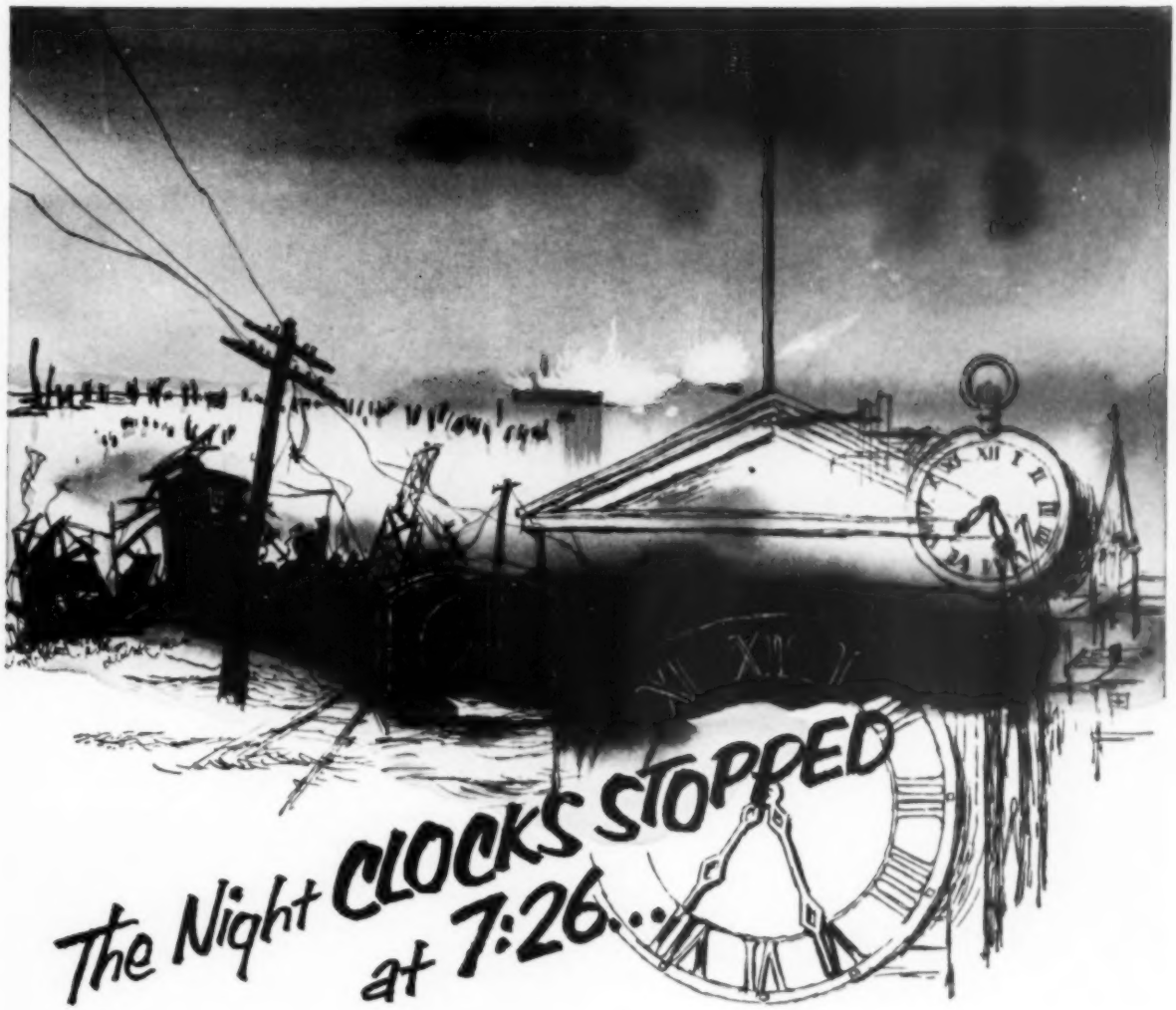
We've learned a lot about making clinker grinders in the past quarter century, and we believe this new model is the best around. Users report that it is not only extremely rugged, but also saves substantial amounts of power. All main bearings are protected by pressurized lantern rings for smooth performance and long life. Designed to grind down to 3-inch spheres.

This new A-S-H Clinker Grinder is just another example of how our engineers "git there fustest with the mostest" in ash and dust handling equipment. Their recommendations will be of vital assistance to you on your next project. Write for our latest catalogs.

THE ALLEN-SHERMAN-HOFF CO.
Dept. L—259 E. Lancaster Ave., Wynnewood, Pa.
Offices and Representatives in Principal Cities

HYDROJET *(hydraulic)* **HYDROVAC** *(pneumatic)*

materials handling systems



Some 9,500 people were in South Amboy, N.J., that drizzly evening in 1950. At the waterfront, longshoremen were transferring the last of 12 freight cars of ammunition to lighters that would carry it to a waiting vessel in Raritan Bay.

But the City Hall clock never got to 7:27—and the freighter's deadly cargo never got loaded. Explosions shattered windows over a radius of 12 miles; and hundreds of people looked at their arms and legs and saw that flying daggers of glass had stabbed them.

At dawn, 312 of the injured had been counted.

★ ★ ★

Such disasters have happened many times before in America. They could happen again. And *if* they do—and *when* they do—there must be blood plasma on hand to take care of the injured. For blood saves lives!

But blood cannot be mined or manufactured. It must come from the veins of healthy men and women. Men and women who feel concern for a suffering neighbor. So give blood—now!

Whether your blood goes for Civil Defense needs, to a combat area, or to a local hospital—this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

National Blood Program

Business Executives!

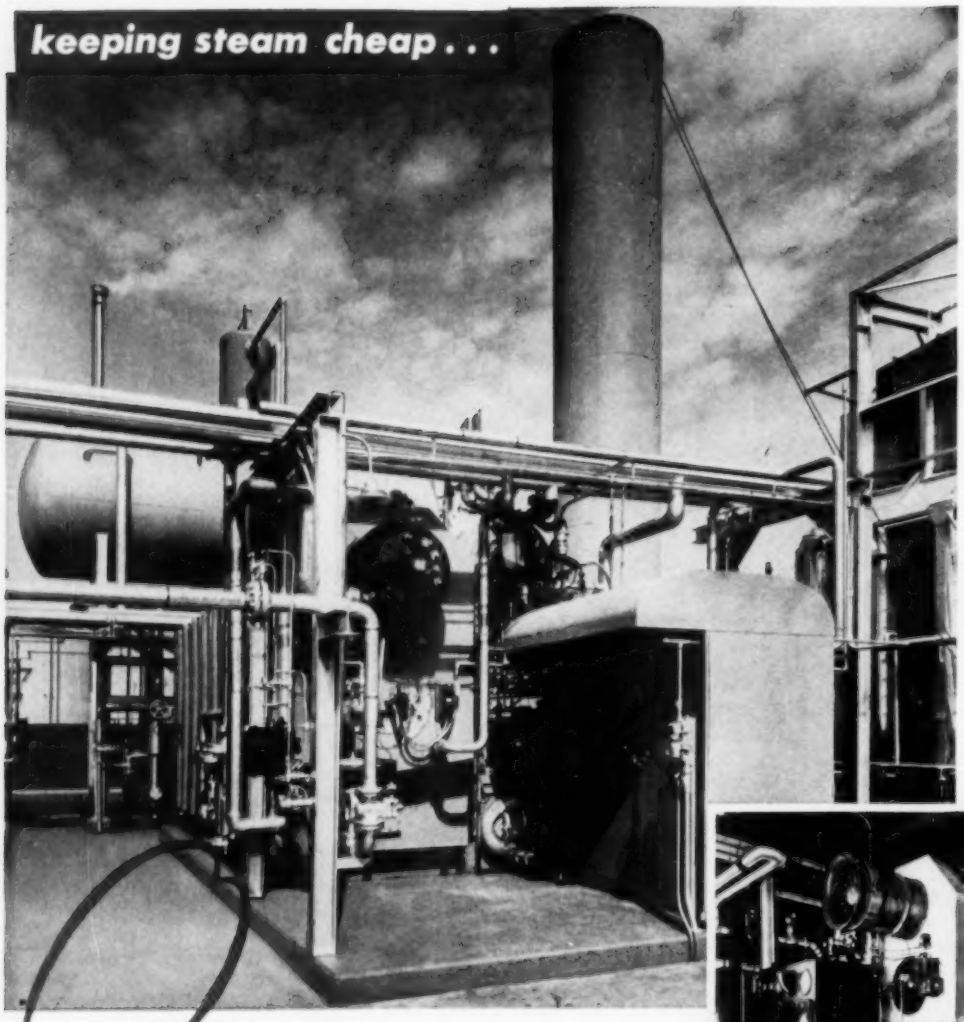
✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

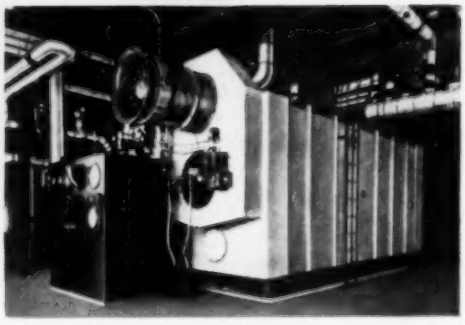
- ☐ Have you given your employees time off to make blood donations?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Has your company given any recognition to donors?
- ☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

keeping steam cheap . . .



Outdoor installation of shop-assembled B&W Integral-Furnace Boiler, Type FM at a large Texas refinery.



Conventional indoor installation uses a minimum of valuable space.

Outdoors as well as indoors
SAVE with the
B&W Integral-Furnace Boiler, Type FM

Outdoor installation of the shop-assembled, *B&W Integral-Furnace Boiler, Type FM,* is an important cost-saving advantage that is gaining wide popularity with users in all sections of the country. A high percentage of units sold to date are for outdoor operation under year-round weather conditions.

A completely water-tight, rigid steel casing encloses the entire boiler and furnace of this compact B&W steam unit. Designed to permit proper expansion and contraction of the unit's various components resulting from seasonal temperature fluctuations, the casing is welded for additional strength and tightness. A blanket of mineral wool plus over-all high-temperature insulation of walls, floor, and roof, minimizes heat loss through radiation.

For installation outdoors or indoors, this versatile, self-contained B&W steam generator is available in steam capacities ranging from 2900 to 28,000 lb per hr, at pressures between 15 and 250 psi. Total steam capacity of units now in service and on order for over 50 different industries, utilities, and other users here and abroad exceeds 5½ million lb per hr.

OTHER COST-SAVING FEATURES

- Saves Erection Time and Cost
- Meets Wide Range of Service
- Handles Quick Load Changes
- Fast Steaming
- Low Maintenance
- Easy Accessibility
- Burns Oil and/or Gas
- Saves Fuel
- Saves Space
- Safe, Automatic Operation

BABCOCK & WILCOX

Write for Bulletin G-76, for an illustrated, detailed description of the many other cost-saving features of this unique unit. The Babcock & Wilcox Company, Boiler Division, 161 E. 42nd St., New York 17, N. Y.

G-386

The fittings that revolutionized pipe welding . . .

In the year 1931 Taylor Forge gave industry its *first real line* of seamless, butt-welding pipe fittings. We say it was the first *real* line because it was the first to include not only long and short radius ells, but also full branch and reducing tees, concentric and eccentric reducers, stub ends, caps and welding neck flanges.

This was a fully planned development. Many years before Taylor Forge had foreseen the future of the butt-welding fitting . . . had realized that pipe welding could not go beyond its then crude stage until pipe users were given *all* the fittings necessary to make up complete piping systems.

So Taylor Forge went to work on this and after long research and development came out with the full line that became the inspiration of modern pipe welding.

Naturally the organization that started ahead has kept ahead . . . in design, in quality, in breadth of line. That is why so many men who have followed the development of the WeldELL line, refuse to consider any other kind of welding fittings.

T F

For up-to-the-minute facts,
see your Taylor Forge distributor

TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS, General Offices and Works: P.O. Box 485, Chicago 90, Ill.
Offices in all principal cities. Plants at: Carnegie, Pa.; Fontana, Calif.; Hamilton, Ont., Canada

POWELL VALVES
actually require
less maintenance.
Second, because they are engineered—in design, materials, and workmanship—to stand up under those service conditions.
And the proof lies in the actual records of the thousands of Powell Valves that are serving all branches of industry.
The Wm. Powell Company
Cincinnati 22, Ohio
Fig. 1800S W. E. 800-pound Cast Steel Pressure Seal Gate Valve with welding ends. A Powell design for the modern Power Plant. Also made for 900, 1500, and 2500 W. S. P.
DEPENDABLE VALVES
SINCE 1846
POWELL

It has been American Blower's privilege to serve these and other producers of power in the public utility field.
Alabama Power Company
Carolina Power & Light Company
Central Arizona Power & Light Company
Central Illinois Electric & Gas Company
Central Illinois Light Company
Columbus & Southern Ohio Electric Company
Connecticut Light & Power Company
Consolidated Edison Company of New York
Consumers Power Company
Consolidated Gas, Electric Light & Power Co. of Baltimore
Connecticut Power Company
Dairyland Power Co-operative
Dallas Power & Light Company
Detroit Edison Company, The
Duke Power Company
Eastern Shores Public Service Company
Fitchburg Gas & Electric Light Company
Florida Power Corporation
Florida Power & Light Company
Georgia Power Company
Gulf Power Company
Hartford Electric Light Company
Indianapolis Power & Light Company
Iowa Public Service Company
Iowa-Illinois Gas & Electric Company
Iowa Power & Light Company
Iowa Electric Light & Power Company
Kansas City Power & Light Company
Kansas Power & Light Company, The
Kansas Gas & Electric Company
Long Island Lighting Company
Los Angeles, California, City of
Louisiana Power & Light Company
Madison Gas & Electric Company
Mississippi Power Company
Missouri Power & Light Company
Niagara Mohawk Power Corporation
Nebraska Public Power System
Northern Indiana Public Service Corporation
Ohio Edison Company
Oklahoma Gas & Electric Company
Omaha Public Power District
Otter Tail Power Company
Pacific Gas & Electric Company
Pennsylvania Power Company
Philadelphia Electric Company
Potomac Electric Power Company
Public Service Company of Oklahoma
Public Service Electric & Gas Company
Public Service Company of Colorado
Southwestern Public Service Company
Southern Indiana Gas & Electric Company
South Carolina Electric & Gas Company
Springfield, Illinois, City of
Tampa Electric Company
Texas Electric Service Company
Texas Power & Light Company
Tennessee Valley Authority
Virginia Electric & Power Company
Worcester County Electric Company of Massachusetts
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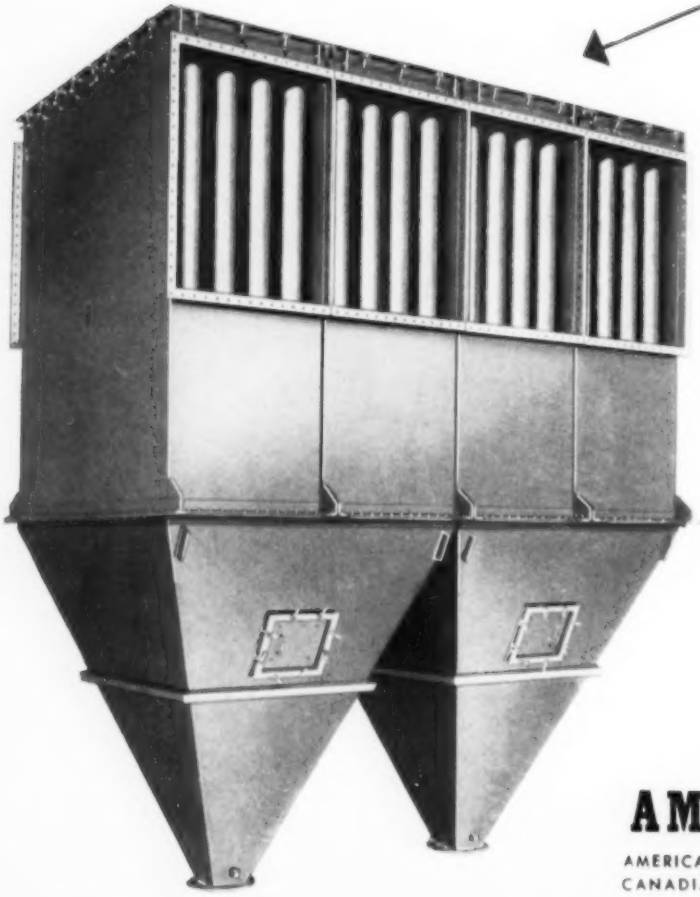
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO
Division of American Radiator & Standard Sanitary corporation

American Blower . . . a time-honored name in air handling

This filter
collects the sludge
from the oil in your car



This American Blower
Fly Ash Precipitator
collects fly ash from boilers
in power plants burning
solid fuels.

In both instances,
objectionable material
is collected in a
proved, practical manner.
Investigate American Blower
Fly Ash Precipitators NOW!

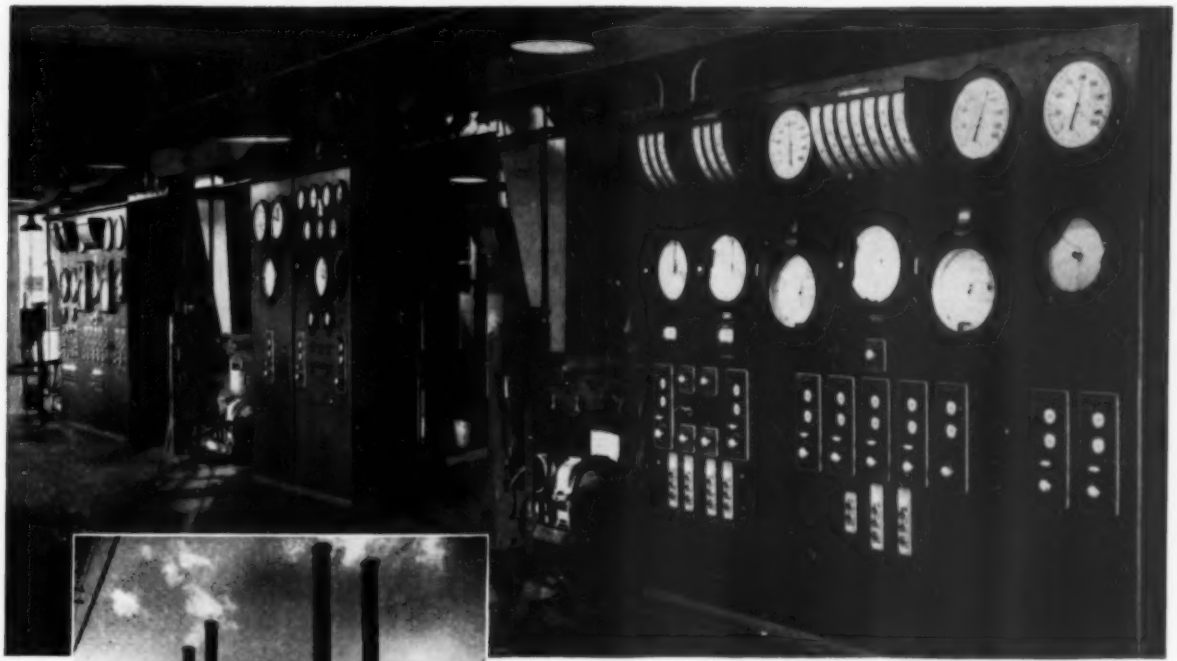
AMERICAN BLOWER

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

Division of American Radiator & Standard Sanitary corporation

Serving home and industry

AMERICAN STANDARD · AMERICAN BLOWER · CHURCH SEATS & WALL TILE · DETROIT CONTROLS · KEWANEE BOILERS · ROSS EXCHANGERS



At JAMESTOWN, NEW YORK MUNICIPAL LIGHT PLANT—

Control and Savings are *Automatic*

***Another Central Station where* REPUBLIC Automatic Combustion Controls.**

SAVE FUEL by continuously maintaining maximum combustion efficiency.

SAVE MAINTENANCE AND EQUIPMENT by holding uniform operating conditions. Chain-of-event type of trouble that frequently develops as a result of incorrect boiler operation is prevented.

SAVE MANPOWER by automatically performing many repetitive adjustments.

HIGHLY IMPORTANT during this critical power shortage, the Jamestown plant meets peak load demands because, with REPUBLIC Combustion Controls, it gets all of the steam output the plant boilers are rated for.

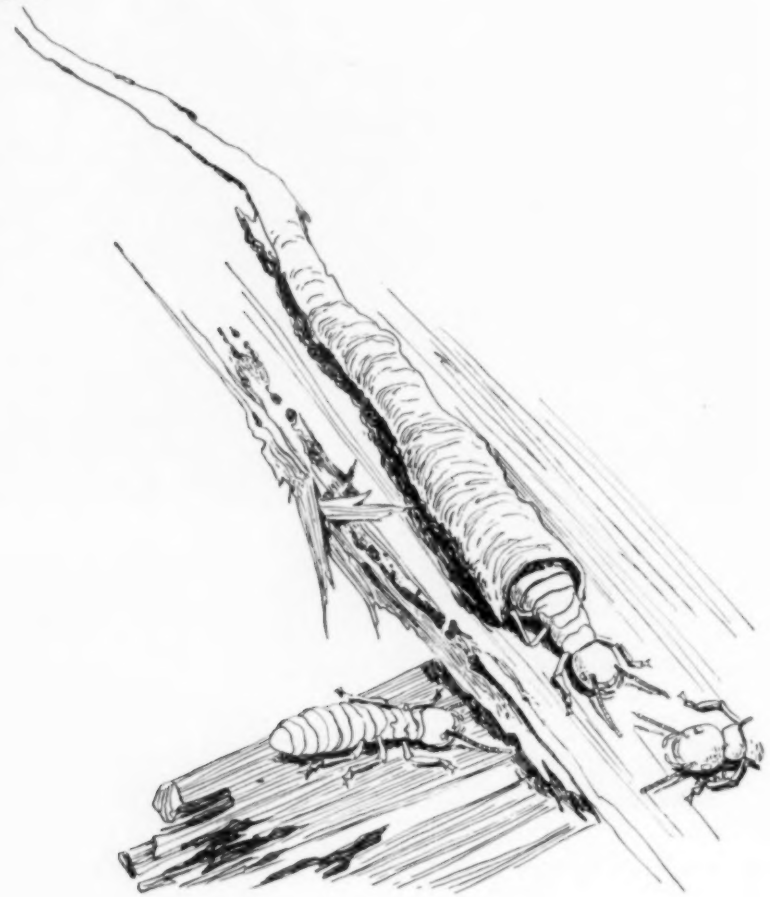
TWO 150,000 lb. per hr. boilers operating at 900 psig. and 900° F.T.T. supply steam to a 20,000 kw turbine at the Jamestown plant. Steam at 275 psig. and 600° F.T.T. is also supplied through a pressure reducing and desuperheater station to an adjoining older plant. Both the Automatic Control System for the boilers and the pressure reducing and desuperheater station were furnished by REPUBLIC FLOW METERS CO.

For more than 37 years, REPUBLIC has designed and built combustion control systems for all types of boilers—all types of fuel firing—all load conditions and any arrangement of draft equipment. You get the benefit of this specialized experience as well as a complete line of control equipment to choose from when you specify REPUBLIC.

For full information about Republic Automatic Control Systems, send for Data Book S-21 or ask that the nearest REPUBLIC field engineer contact you.

REPUBLIC FLOW METERS CO. ● 2240 DIVERSEY PARKWAY • CHICAGO 47, ILLINOIS

tubing...



Blind from birth, termites, the industrious scavengers of the forests, often build their own peculiar tubing in order to reach a wooden structure.

Pipe and Tubular Products fabricates tubing, too, but for vastly different purposes: condenser tubes, boiler tubes, tubing for superheaters as well as welded tubing and structural fabrication. And our new, larger plant at Catasauqua, Pa., means greater variety of service to our customers, widens horizons for our clients.

Our facilities for the fabrication and bending of piping and tubing are bigger than ever before—50,000 square feet. With these added facilities, we've been shipping more orders in less time . . . orders for tubing for many things from bicycle frames to bus exhausts, tubular parts for trucks and tractors, motors and machinery, frames and fuel lines . . . the list is long and varied. We bend all kinds of tubes to different shapes for many purposes.

Service, however, remains paramount with us. An extremely large warehouse stock of resistance-welded and seamless tubing from ½" to 5" OD means no waiting for mill delivery. On emergency repair jobs, shipments are made the same day the order is received.

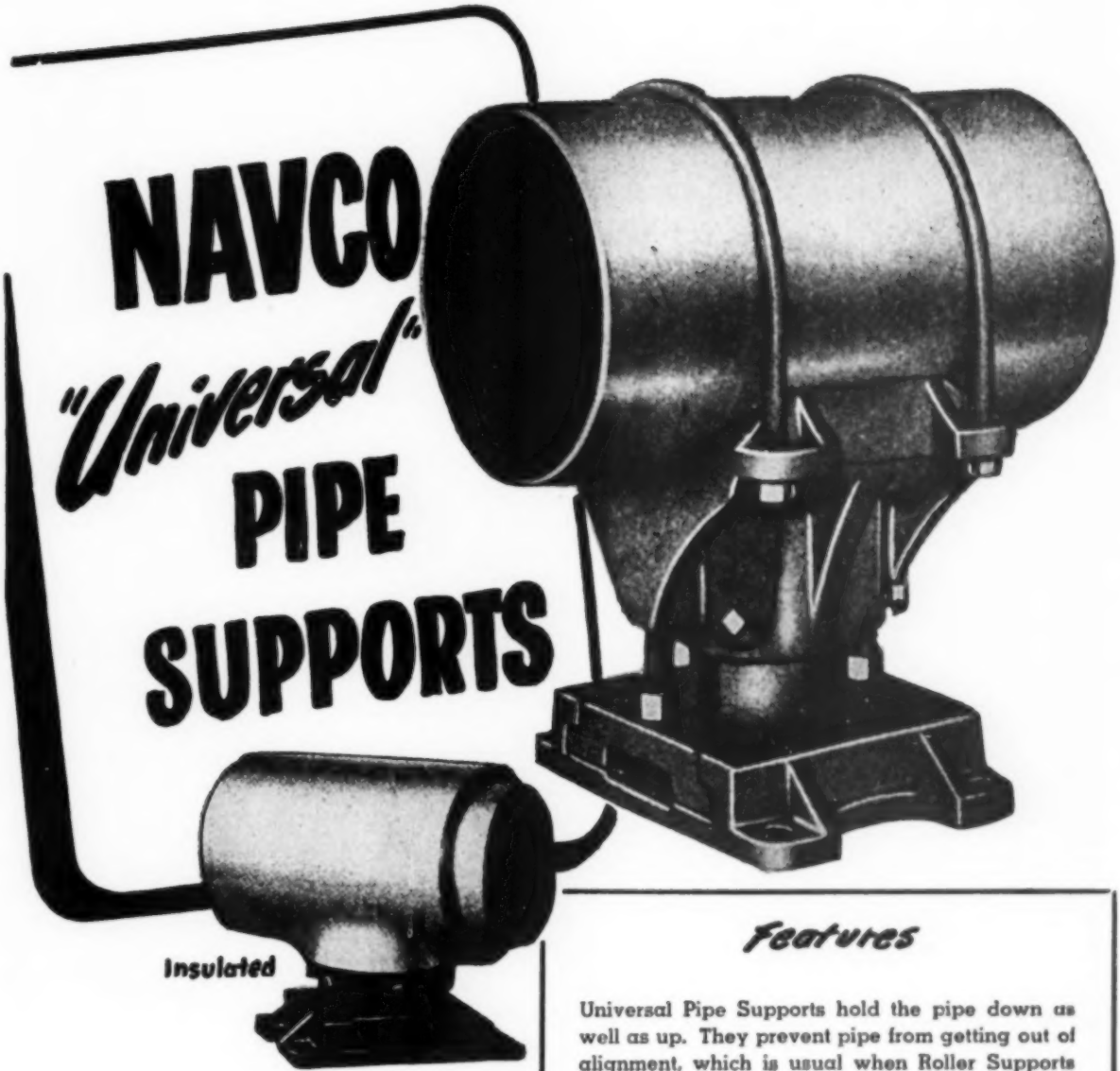
Why not take advantage today of highly-skilled workers, a specialized experience of many years in this field, and extra-fast delivery by a big fleet of trucks? Unlike the termites, we have our eyes wide open . . . especially when it comes to fast, dependable service.

PIPE & TUBULAR PRODUCTS
INCORPORATED
Tubing P&P *Specialists*

OFFICE: 8304 GERMANTOWN AVENUE, PHILADELPHIA 18, PA.
PLANT: CATASAUQUA, PENNSYLVANIA

tubing and piping • warehousing and fabricating • engineering and machining

NAVCO "Universal" PIPE SUPPORTS



Vertical adjustment up to 2½ inches can be made.

Support may be turned to any angle of 360°.

Will take care of 8 inches of travel.

Features

Universal Pipe Supports hold the pipe down as well as up. They prevent pipe from getting out of alignment, which is usual when Roller Supports are used.

They permit control of expansion movement and insure the desired free action of Slip Expansion Joints so essential in tunnel and duct work.

Expansion movement of pipe will not disturb the insulation.

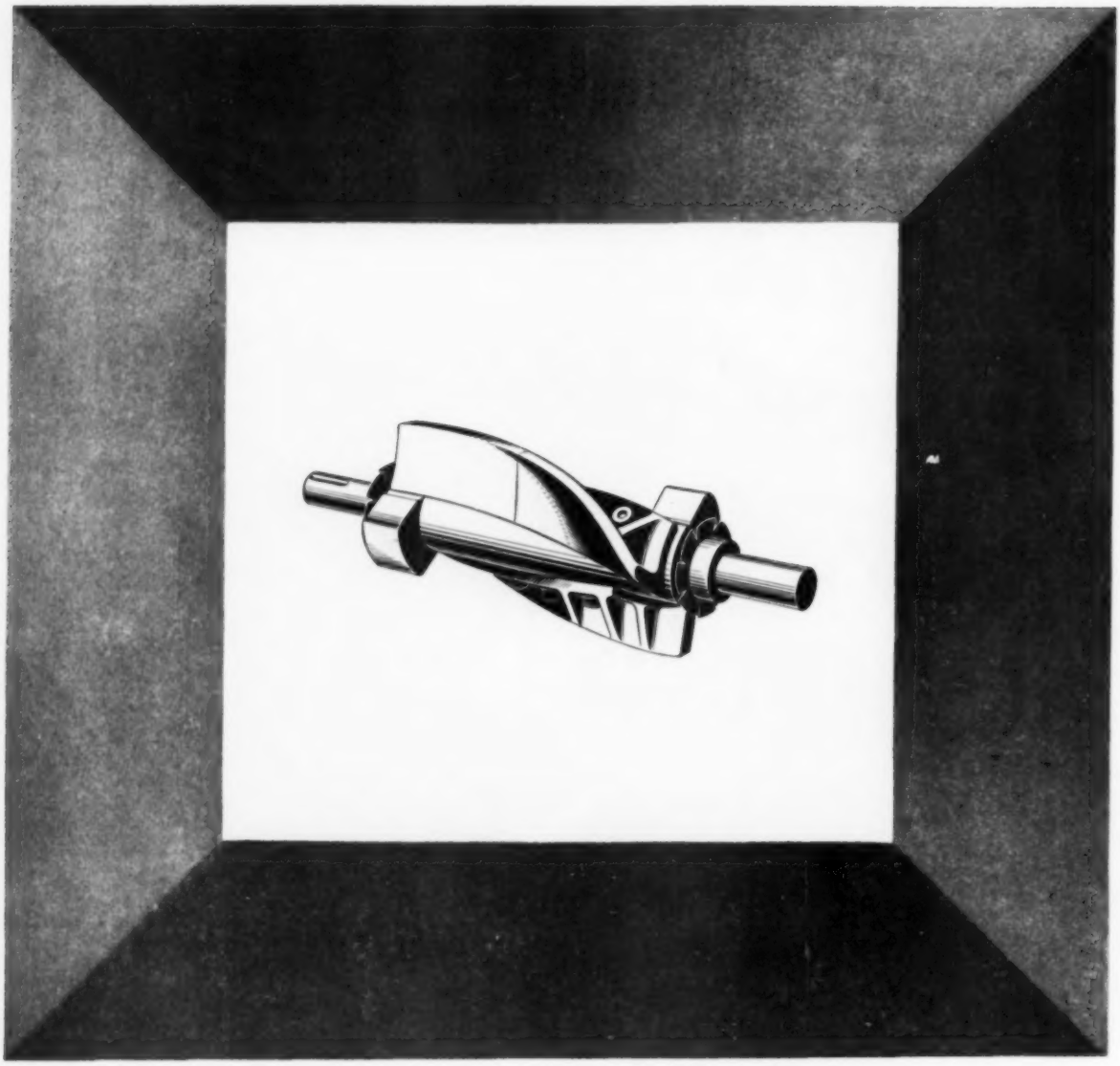
Made in Cast Iron or Steel and provided with forced lubrication for lines exposed to the weather.

NAVCO

NAVCO PIPING

NATIONAL VALVE & MANUFACTURING COMPANY • PITTSBURGH, PA.

NEW YORK • CHICAGO • CLEVELAND • BOSTON • ATLANTA • TULSA • BUFFALO • CINCINNATI



How to make a stoker with Perfect Spread

WHETHER YOU PLAN to buy a new unit or to re-stoker an old one, it must be engineered to assure top efficiency with both low and high ash coals. And a prime requisite for such efficiency is *even* coal distribution over the entire grate . . . the perfect spread that is provided only by American Engineering's unique spiral overthrow rotor.

Supplementing that, you need the exclusive Perfect Spread traveling conveyor feeder that *won't clog . . . not even on wet coal.* This feeder operates on a high traction principle that provides true, *continuous* feeding throughout its whole range of 50 to 7500 lbs. of coal per hour. And for maximum combustion . . . most steam per fuel dollar . . . the special AE cinder return and adjustable overfire air system are unsurpassed.

Perfect Spread Stokers are available in a wide choice of sizes, capacities and grate types. Ask to have an American Engineering Company representative call and discuss your exact requirements.

AE

AMERICAN ENGINEERING

COMPANY

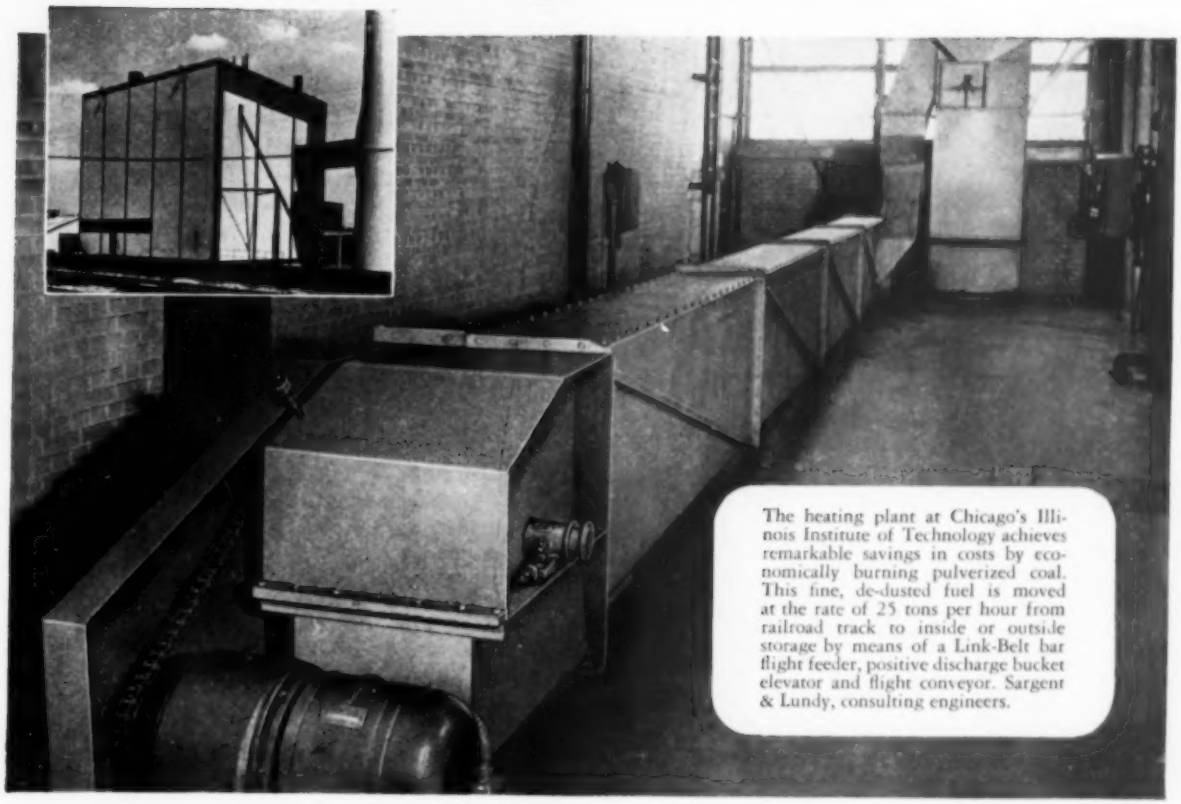
2421 ARAMINGO AVE., PHILADELPHIA 25, PA.

IN CANADA: AFFILIATED ENGINEERING CORPORATIONS, LTD., MONTREAL 2, CANADA

AE Products are: Taylor and Perfect Spread Stokers, Marine Deck Auxiliaries, Hele-Shaw and Hydramite Fluid Power, Lo-Hed Hoists, Lo-Hed Car Pullers.

For 1 ton or 2000 tons

of coal per hour...



The heating plant at Chicago's Illinois Institute of Technology achieves remarkable savings in costs by economically burning pulverized coal. This fine, de-dusted fuel is moved at the rate of 25 tons per hour from railroad track to inside or outside storage by means of a Link-Belt bar flight feeder, positive discharge bucket elevator and flight conveyor. Sargent & Lundy, consulting engineers.

LINK-BELT equipment cuts handling costs

NO TWO power plants have identical coal handling requirements. That's why Link-Belt is in a unique position to help you get the most efficient system for your special conditions.

Large or small . . . boat, rail or truck-supplied . . . inside or outside storage — Link-Belt engineers can bring a vast store of experience to focus on your particular problems.

Equally important, Link-Belt builds all types and sizes of unloading and handling machinery. You get the *right* equipment for the job, to fit your needs *exactly*.

Link-Belt can take care of every detail of your coal handling system, from planning through erection. For full information, call the Link-Belt office near you.

Link-Belt equipment for power plants...

Railroad car dumpers and shakers; coal displacers; receiving hoppers; dock cranes and unloading stations; silo and ground storage systems; coal crushers; dryers; feeders, conveyors and elevators of every type; weigh larries; complete line of chains and mechanical power transmission machinery.

LINK-BELT

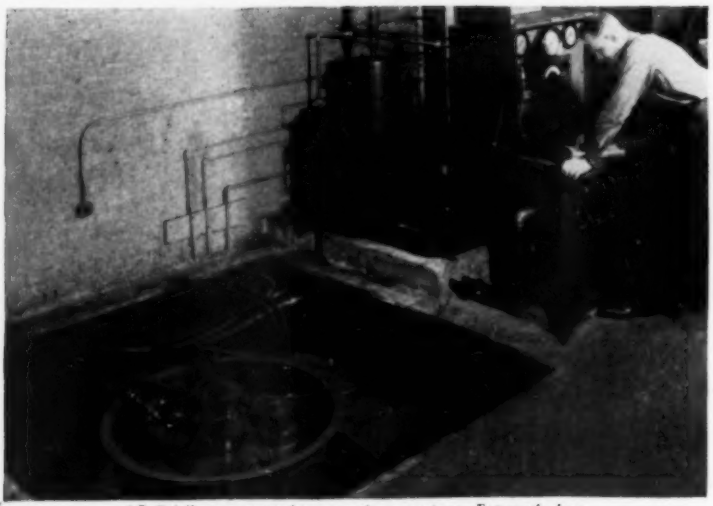
COAL HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices in Principal Cities. 12,278

New Book 2410 contains 44 pages of typical power plant handling equipment and layouts. Ask for your free copy.

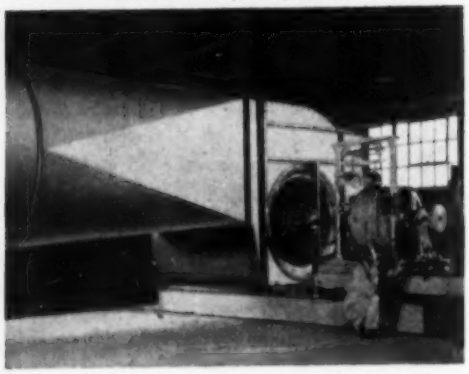
Why it costs more to build

"Buffalo" FANS



"Buffalo" vacuum pit for test-spinning rotors. Extremely low vacuum in pit enables rotors to be spun at high speeds to ultimate destruction.

Dynamic balance of "Buffalo" fan wheels guarantees smooth quiet operation.



Accurate testing assures rated performance of "Buffalo" Fans.

As many readers of this advertisement know, "Buffalo" was the first manufacturer of air moving equipment to treat air engineering as a serious scientific subject, worthy of continuous study. With the publication, in 1914, of "Fan Engineering," now in its Fifth Edition, Buffalo Forge Company paved the way for the tremendous expansion in all forms of air handling, conditioning and cleaning, which we now accept as common-place.

We have never deviated, for one year, from the ideals which led to "Fan Engineering" in 1914. We are still interested basically in the "Q" Factors*. This means the building of the best possible product.

This policy has cost us some business in the past, and no doubt will in the future. It has, however, earned us a reputation for fine performance over long periods of years, and has enabled our company to sell many of the finest and most outstanding installations in industry and commerce.

When you buy "Buffalo" Fans, Air Cleaning or Conditioning Equipment, you can be sure that you are getting the best that seventy-five years of experience can produce.

Engineering Sales Representatives in all principal cites are anxious to work with you.

*—*The "Q" Factor—The built-in Quality which provides trouble-free satisfaction and long life.*

DIAMOND JUBILEE 75 YEARS ANNIVERSARY

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

530 BROADWAY BUFFALO, NEW YORK

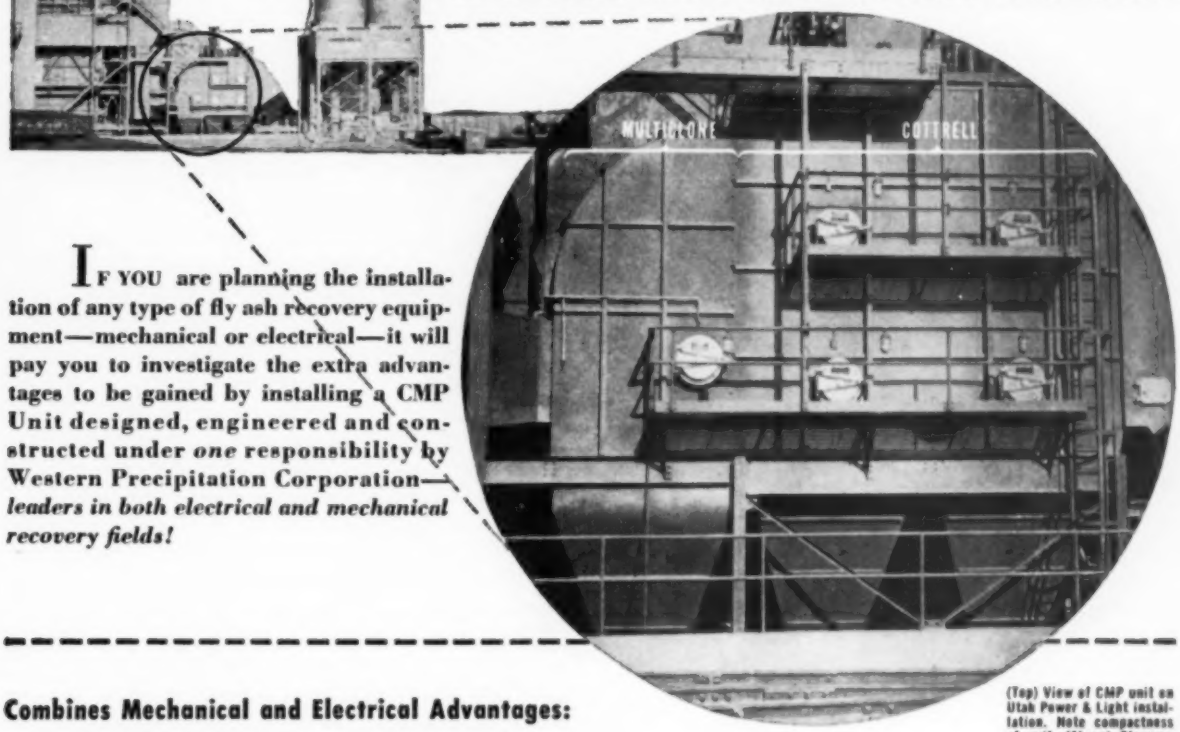
PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

VENTILATING | PRESSURE BLOWING | AIR CLEANING | COOLING | AIR TEMPERING | HEATING | INDUCED DRAFT | FORCED DRAFT | EXHAUSTING

Planning A Fly Ash Recovery Installation?

Consider these important advantages of a WESTERN PRECIPITATION CMP UNIT!



IF YOU are planning the installation of any type of fly ash recovery equipment—mechanical or electrical—it will pay you to investigate the extra advantages to be gained by installing a CMP Unit designed, engineered and constructed under *one* responsibility by Western Precipitation Corporation—*leaders in both electrical and mechanical recovery fields!*

(Top) View of CMP unit on Utah Power & Light installation. Note compactness of unit. (Above) Close-up of same installation.

Combines Mechanical and Electrical Advantages:

A CMP (Combination Multiclone-Cottrell Precipitator) Unit combines—in one compact installation—both mechanical and electrical recovery principles, so that maximum benefit is obtained from the advantages inherent in each method. The MULTICLONE section centrifugally cleans the gases of the larger and heavier fly ash particles (down to a few microns in diameter) . . . and the COTTRELL Precipitator then electrically removes the very small particles remaining in the gases. This combination arrangement has important advantages:

1. Using the MULTICLONE for cleaning out the heavier particles permits the bulk of the recovery operation to be performed with relatively low-cost equipment.

2. Using the COTTRELL for final clean-up insures unusually high recovery efficiency—approaching theoretically perfect, if desired—with a high efficiency, compact Precipitator unit.

3. Each type of unit—MULTICLONE and COTTRELL—can be arranged for its most efficient application. MULTICLONES may be connected to each separate boiler, if desired, and their draft requirement cut out when the boiler is down . . . while a central COTTRELL handles all gases and operates at higher efficiencies, with continued low power cost, when one or more boilers are down.

4. During soot-blowing periods, or while warming up cold boilers, the MULTICLONE efficiency usually increases, preventing overloads of detrimental carbon from reaching the COTTRELL.

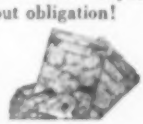
Only Western Precipitation Combines Multiclone and Cottrell "Know-How"—In ONE Organization!

A vital factor in obtaining maximum efficiency and economy in CMP installations is the proper balance of mechanical and electrical recovery equipment to the individual requirements of *each* application. Western Precipitation is unique in that it not only pioneered the commercial application of COTTRELL Electrical Precipitators over 43 years ago, but also has been a leader for many years in the *mechanical* recovery field with its widely-recognized MULTICLONE Collectors.

Result—Western Precipitation has the all-important "know-how" and experience in BOTH fields . . . knows from first-hand experience how to fit the *right* equipment in the *right* place, to do *your particular* job . . . and can provide the complete installation under ONE responsibility and ONE overall guarantee!

Let Our Experienced Engineers study your recovery requirements and make recommendations on the equipment best suited to your operations. A wire, phone call or letter to our nearest office places this unique "Know-How" at your service, without obligation!

Send for descriptive literature!



WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

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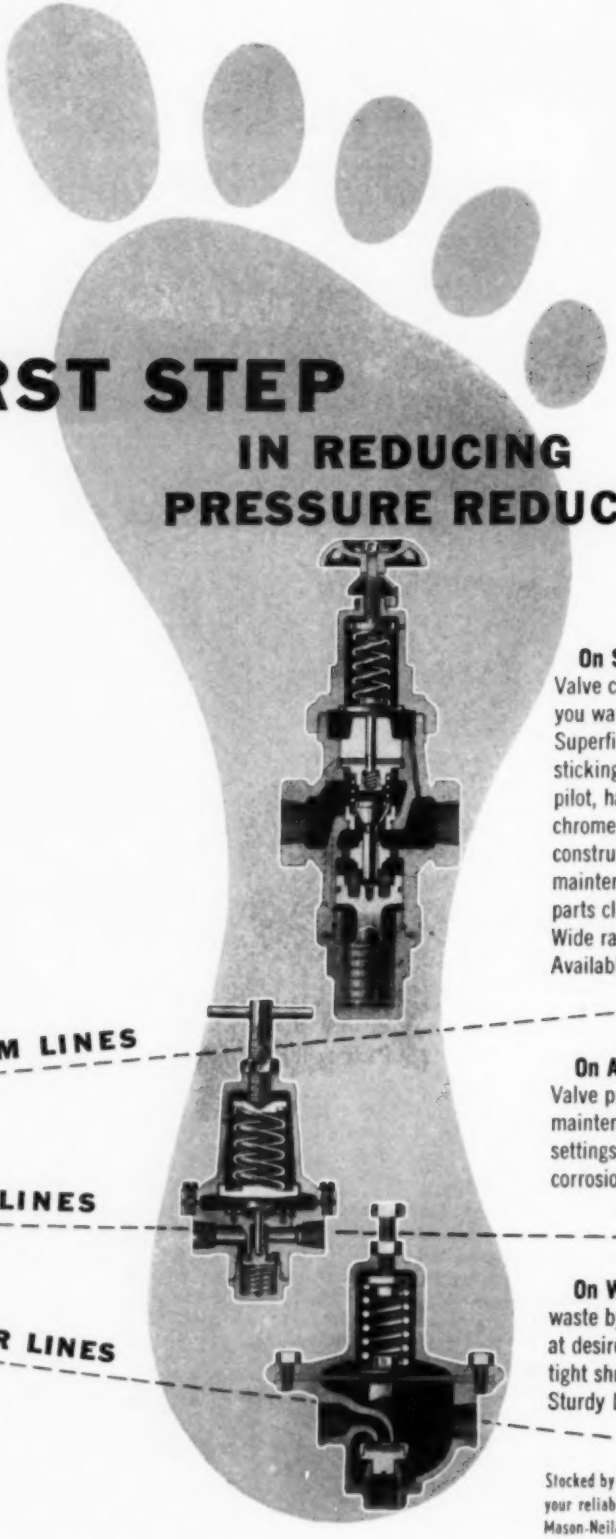
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

FIRST STEP
IN REDUCING PRESSURE REDUCING COSTS



ON STEAM LINES

On Steam Lines Masoneilan No. 11 Reducing Valve cuts costs by holding pressures where you want them with a minimum of attention. Superfinished parts increase sensitivity, prevent sticking and corrosion. Stainless steel integral pilot, hardened stainless steel valve, chrome-nickel steel seat ring, rugged construction throughout combine to reduce maintenance to little more than keeping parts clean. Serviced in the line. Wide range of reduced pressure settings. Available in bronze, iron or steel.

ON AIR LINES

On Air Lines Masoneilan No. 71 Reducing Valve provides accurate control with minimum maintenance. High capacity at all pressure settings. Rugged brass construction resists corrosion. May be serviced in the line.

ON WATER LINES

On Water Lines Masoneilan No. 227 avoids waste by maintaining industrial water pressure at desired point without cutting down flow. Has tight shutoff. Requires little or no maintenance. Sturdy bronze construction prevents corrosion.

Stocked by or available through your reliable Industrial Distributor. Or write Mason-Neilan Regulator Co., 1208 Adams St., Boston 24, Mass.

MASONEILAN REGULATORS

Keep Pressure under Control

ALL HIGH CQ PRODUCTS

TNEMEC PRIMERS KILL RUST!

THE first step in preserving steel with paint is applying the prime coat. Its primary job is to prevent and kill rust action. TNEMEC Primers do just that, by creating a neutral condition on steel surfaces, changing active rust and corrosive agents into an inactive neutral compound.

The second step is applying the finish coat that will provide protection against the specific exposure hazards involved.

WHAT IS YOUR EXPOSURE HAZARD?

Is it the humid, salt-air atmosphere of coastal areas? Is it the acid-laden atmosphere found in and around industrial plants, refineries, steel mills, the processing industries, etc? Is it submersion in sewage treating vats, in salt brine, or in fresh water tanks?

No matter what your problem is, there is a TNEMEC Finish Coat to solve it. And remember . . . you will always save many maintenance dollars by doing the job *right*.

Ask Any TNEMEC User

(TEE-NEE-MIK)

MAIL THIS COUPON FOR YOUR COPY OF TNEMEC CATALOG 50

SEE OUR CATALOG IN SWEET'S

TNEMEC COMPANY, INC.

TNEMEC COMPANY, INC.
131 W. 23rd Ave., North Kansas City, Missouri

Gentlemen:
Send my copy of your Catalog 50 to:

NAME _____

FIRM NAME _____

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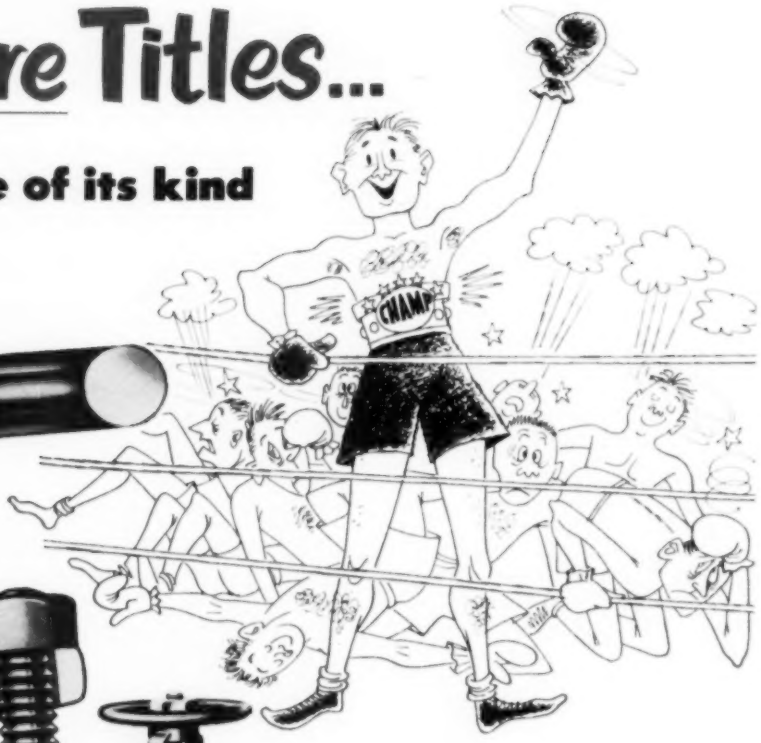
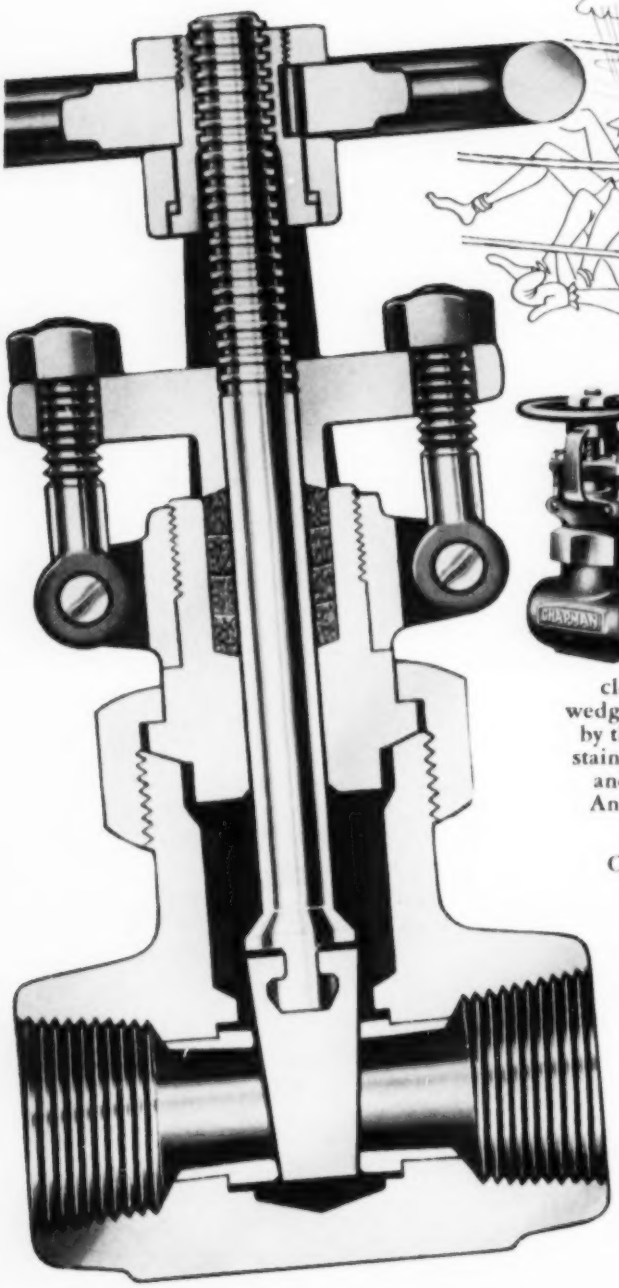
CITY _____ ZONE ___ STATE _____

CHAPMAN LIST 960

Holds More Titles...

than any valve of its kind





Yes, here's the champ of all small forged steel gate valves! It has licked more different jobs than you can shake a stick at . . . and stays in there fighting with all the *extra stamina* you get in *every* Chapman Valve.

Here are the reasons why: Extra protection against even unusual stress when opening and closing the valve is provided by extra-strong stem-and-wedge-gate connection. Repairs and replacements are cut by the use of super-hardened seat rings and gate faces of stainless steel. Forged body and yoke are longer-lived . . . and bolted follower has no threads on yoke to corrode. And lastly, gate faces won't seize or gall because they're *Malcomized* (Chapman patent) to 800 Brinell.

Chapman List 960 Forged Steel Gate Valves are made in sizes from ½" to 2" inclusive . . . with rising stem with yoke (shown) or with rising stem with inside screw. Bonnet joints are either gasketed or metal to metal. Pressure range: 2,000 lb. at 100° F. — 380 lb. at 1,000° F. For higher pressures, specify List 990. And for full details on List 960, send today for your copy of Catalog 10.

THE CHAPMAN VALVE MFG. CO.

INDIAN ORCHARD, MASS.

Timely Comments

Here Today . . . and NOT Gone Tomorrow

GROWING . . . plant by plant, process by process . . . is the story throughout the SOUTH-SOUTHWEST. Unprecedented is the only word that describes the rate at which the South-Southwest is expanding its industrial capacities. New plants and additions to plants of significant proportions totalled over 2,500 in this area in 1952. They were announced through SOUTHERN POWER & INDUSTRY's Industrial News Service during the past year.

Perhaps unnoticed in this rapidly changing industrial picture is the improved status of the LUMBER INDUSTRY—it now has an eye to permanence. The timber growing industry has reached a sustained yield basis through modern forestry and timber farming methods. It is only natural that progressive lumber manufacturers, assured a more stable source of supply and a more stable economic condition in their industry, should look to the future and plan the modernization of old mills and the construction of new ones on a permanent basis.

Only 25 years ago, the yearly national cut was four times the annual growth, and mills built then were not built with such an eye to permanence. Today, the picture has changed radically with growth already up to 98 per cent of yearly cut, and mill operators are beginning to capitalize on the improved situation they have helped to create. They can now plan their programs on a permanent basis by combining good forestry practices with improved mill designs.

Texas Lumber Mills Typify Trend

Typical of the "bigger and better" mill trend is the modernization program of the Southern Pine Lumber Company at Diboll, Texas, described in the September, 1952 issue of SP&I. The plant is now one of the most up-to-date and streamlined operations to be found in the industry. The modernization embraced the entire plant from log handling through finished lumber shipment plus steam and power generation facilities. The results are a greater ease of production, improved working conditions and worker morale, increased efficiency, safer working conditions, and a greater production volume of higher grade Southern yellow pine and hardwood lumber.

The new $10 million lumber mill of the Kirby Lumber Corporation, now under construction at Silsbee, Texas, will be one of the most modern in the South—18 buildings, 10 miles of railroad trackage, occupying 250 acres, and employing over 600. H. E. Bovay, Jr., Consulting Engineers of Houston, Texas, designed the new mill. The same engineers also handled the design work on the Southern Pine Lumber Company modernization noted above.

At the Kirby mill nearly $1 million worth of electrical equipment will be supplied by one large manufacturer; two 3500 kw condensing automatic extracting turbine generators operating at 3,600 rpm, switchgear, power centers, electric log carriage drives, gearmotor drives for conveyors, and lighting fixtures.

Four log carriages will be driven by d-c motors through gear units, and d-c will be supplied for each drive by 400 hp motor generator sets. Although weight of a carriage plus log will run up to 39,500 lb—smooth, rapid operation will be obtained by the use of magnetic amplifier regulators. A master controller will put control of carriage speed literally at the sawyer's fingertips.

The modernization of the Southern Pine Lumber Company and the new mill now under construction for the Kirby Lumber Corporation exemplify the modern trend in the lumber industry, but they are by no means the only ones worthy of mention. For example: W. T. Smith Lumber Co. at Chapman, and Allison Lumber Co. at Bellamy, Alabama, have worked hard and long to create sustained yield for their excellent milling programs. And much could be said also about greatly improved cooperation among the major users of timber resources such as paper mills, pole and tie producers, lumber mills, and finishing plants.

The lumber industry is now on a permanent basis. Here Today . . . and NOT Gone Tomorrow.

LEFFEL *sells satisfaction...*

THE BROWN BRIDGE
TROY, OHIO

OFFICE OF
JOHN A. SHARTLE

Mr. C. W. Schmidt
James Leffel & Co.
Springfield, Ohio

Dear Mr. Schmidt:

Many years ago, it became necessary for us to make a change in our steam equipment and we bought one of your Scotch Type Oil Fired Boilers. This boiler was so satisfactory that when we expanded our plant some time back we purchased another exactly like it and now they stand side-by-side doing a marvelous job to our satisfaction.

We feel that by the savings we have made we have paid for these two boilers many times over.

Very truly yours,

THE BROWN-BRIDGE MILLS, INC.

John A. Shartle, President

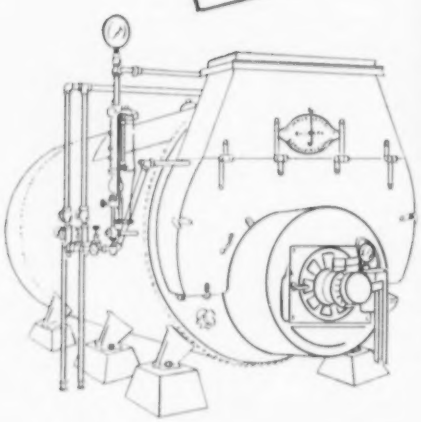
as well as
SCOTCH BOILERS

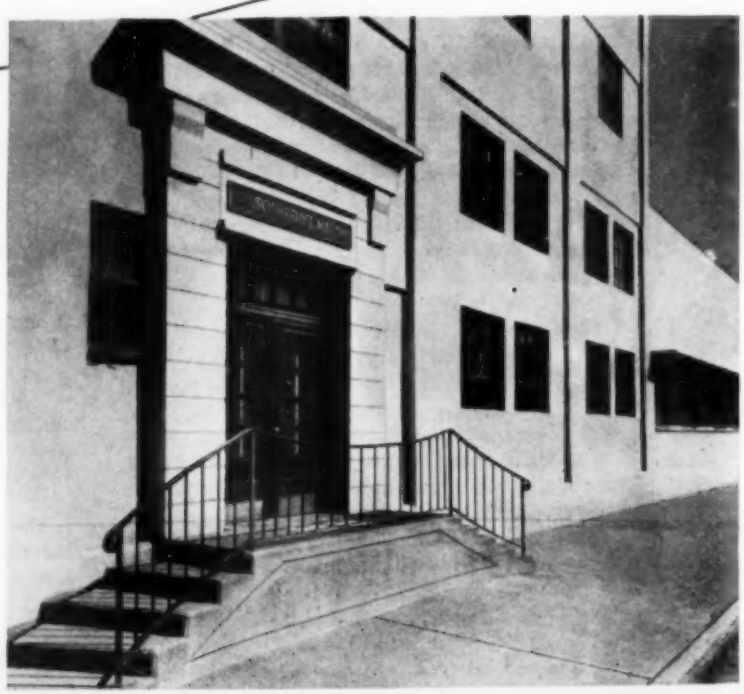
The trend to Leffel Scotch Boilers is greatest among those who have had previous boiler experience. Brown-Bridge Mills, Inc., Troy, Ohio, one of the country's leading manufacturers of gummed papers and gummed tapes, purchased a Leffel boiler years ago. It has served them ever since.

A recent plant expansion necessitated a second boiler. They specified an identical unit. Experience . . . ***experience with Leffel*** . . . pointed the way to year-after-year dependability and economy in steam.

Leffel Scotch Boilers are used in hundreds of industries where highest quality process steam is required. That is why Leffel boilers are frequently chosen when ***additional*** steam is needed.

Rugged, dependable, they come in a wide range of sizes; they burn ***gas, oil or coal;*** they convert easily from one fuel to another. Conservative ratings allow up to 100% overloads. Tell us your steam problem; we'll help you solve it.





Leffel is proud to have contributed to the progress of Brown-Bridge Mills, Inc., an industrial leader, whose plant entrance is shown here.

Sheet 8-30-52

FOUNDED IN 1862

THE JAMES LEFFEL & CO.

DEPT. B, SPRINGFIELD, OHIO, U. S. A.

MORE EFFICIENT STEAM GENERATION FOR 91 YEARS

Industry Speaks

SOUTHERN POWER AND INDUSTRY

Ready for the NEXT BIG STEP?

Materials Handling

Adapted from comments by George Spatta, president, *Clark Equipment Company*, one of the nation's leading manufacturers of industrial trucks.

MANUFACTURERS are becoming aware that the "direct" labor costs involved in the actual production of a product are generally a small fraction of the total cost of that product and very often these operations have been mechanized to the point that further economies are not possible without tremendous capital outlays.

On the other hand, it is often possible to reduce certain "indirect" costs attendant to the manufacturing operation. The method of handling materials, particularly in prewar plants, is generally the first and most likely target. Introduction of efficient equipment can result in immediate savings, and in each passing month we find more and more economy-minded companies who are placing their first orders for industrial trucks.

Are You a Potential Customer?

Any company employing 15 to 18 people and in which the handling of materials is a major factor is a potential customer for an industrial truck. In addition, in organizations, large or small, where heavy lifting must be done only occasionally, lift trucks have proved to be economical, and many firms are now using them to supplement plant maintenance crews.

The high cost of construction has helped accelerate acceptance and use of the fork-lift truck, particularly among industries where warehousing finished or partially finished production is a problem.

Use of the fork-lift truck has enabled some manufacturers to almost double the capacity of existing warehousing facilities. Not only has this been accomplished without additional construction, but it has often been accomplished with an actual reduction in the number of warehouse employees. Fork-lift trucks and pallets do the job.

From a marketing standpoint, 1939 may be regarded as a starting point in the widespread use of industrial trucks. Even though thousands of units were produced during World War II and in the years that have followed, it is reasonable to assume that the units we have delivered fill only a relatively minor portion of the overall market potential.

Today's industrial truck position is comparable with the position of the automobile in the late '20s —just enough of them had been produced to whet the appetite of the mass market.

Control Devices

Adapted from comments by *Henry F. Dever*, president of *Brown Instruments Division* of Minneapolis-Honeywell Regulator Company, before the eighth annual instrumentation conference at Texas A&M College.

INDUSTRY, which has been investing between 7 and 8 per cent of its capital expenditures on recorders and controllers, was pictured as ready for building the maximum of automatic controls into each new factory "from the beginning."

This could mean that U. S. industry's investment in instruments would rise to between 10 and 15 per cent of its capital expenditures for machinery and equipment. And, this figure would be applied to increasingly larger expenditures as the economy grows.

Management that has become conditioned to traditional ratios of spending, must now recognize that this advance planning, or "systems engineering," justifies its cost. In almost any mass production even minor improvements in efficiency are measurable in anywhere from thousands to millions of dollars yearly.

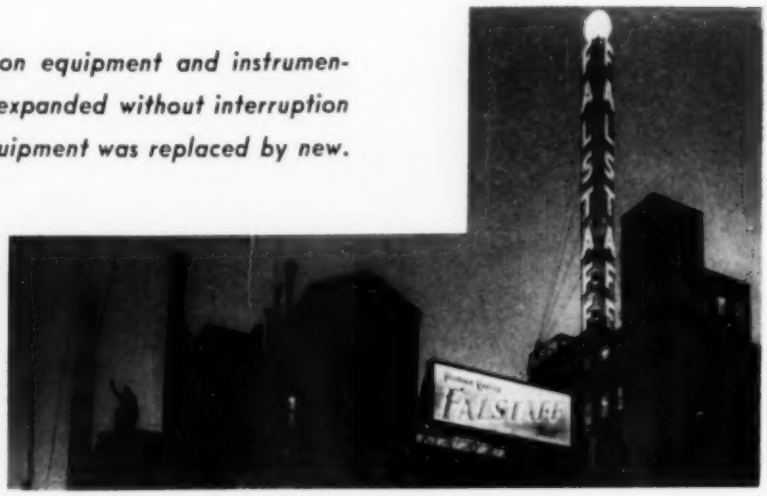
The Utopian concept of fully robotized factories is "still in the realm of science fiction." Until the responsibility for this advance planning is settled and until technological education is broadened, widespread fully automatic manufacturing will not be an industrial reality. Furthermore, unless the economics are right this technology will be of little use. He reminded the group that "there will always be some areas where full automation will never make engineering or economic sense."

Stating that it is imperative that American industry develop the full potential of automatic control —"currently we are only about 10 to 20 per cent along the way"—Dever pointed out that America's civilian work forces will just not be able to cope with tomorrow's needs unless it has the widespread use of mechanical aids.

From 1940 to 1950, he explained, the nation's population climbed some 20 million and is likely to grow that much again in the next 10 years. "By the time these youngsters grow up our present labor force, big as it is—and it's now only about one million under the last war's peak—will be hard pressed to meet the new demands for cars, homes, clothing, food, or any of the things people want. Automatic controls and industrial instruments can be utilized to ease this productive burden," he said, "the better if they are engineered into each new production facility at the outset rather than merely 'applied' after the process has been set up."

Expansion Program Completed Without Interruption to Process

Boiler plant, refrigeration equipment and instrumentation modernized and expanded without interruption to production as old equipment was replaced by new.



By CHARLES BERGMANN
Superintendent of Engineering
Falstaff Brewing Corporation

AT the close of World War II, sales in the southern distribution area of Falstaff Brewing Corporation had climbed to heights which strained the production capacity of the brewery's New Orleans plant. It was decided by Falstaff management to enlarge that plant.

This expansion program was to cover the entire plant in scope, with additions of a new brewing "line," new bottle shop equipment, and several new buildings and additions, among them an eight-story addition to the brewhouse containing more than 1,000,000 cu ft of space.

To furnish power and steam for these new additions, it was further decided to scrap three old boilers and replace them with two new Babcock & Wilcox FF-16 No. 48 boilers with a design pressure of 200 psi and rated to deliver 50,000 lb/hr. To service these new boilers, Copes feedwater regulators, combustion safeguards, Babcock & Wilcox combination oil and gas burners, and Republic controls were to be used.

Planning and Organization

Two factors, however, were introduced that made the task more difficult. First, because of the plant's location, space limitations forced us to install the new equipment in the area occupied by the old.

Second, because of the productive requirements of the plant, it would be necessary to make the installations without a prolonged shutdown of the plant, even without a loss of production, if this were possible.

The close coordination between Chris Kaupp, chief engineer at the New Orleans plant, and George League, superintendent of mechanical installation, resulted in the attainment of both objectives. During the entire two year program of installation and modernization, there was no loss of production or plant shutdown due to the boiler replacement program.

These two men were assisted in their planning by two members of the engineering department, Charles M. Nohavec and Donald E. Watkins, while the construction department, under the direction of Reed L. Young, Falstaff superintendent of construction, was responsible for the overall planning of the construction phases of the program. Young was assisted by Arthur T. Cochrane, H. Robert McKee and Robert D. Dressler.

New Steam Plant

Our first step was the installation of a new Cochrane deaerating boiler feedwater heater with a capacity of 60,000 lb/hr. This was to be made in the same area occupied by the old feedwater heater. To accomplish this, we decided to install a temporary surge tank in an area behind one of the old boilers. Two of the old steam-driven boiler feedwater pumps were also moved to this area.

For the temporary surge tank we used an old discarded air tank, 42 in. in diameter and 5 ft long. We cut the top head out of this tank and installed a 2 in. city water line from our water softeners to it, using a float valve to regulate the level of water in the surge tank. All the condensate return lines were also connected to this surge tank, and we welded our pump suction connection and connected our two oil boiler feedwater pumps. When this was accomplished, our boiler feedwater was

pumped from the temporary surge tank to the old boilers.

Removal of the old boiler feedwater heater and boiler feedwater pump foundations next occupied our installation crew, after which they installed the new heater and pumps, complete with the necessary steam and water lines. These both were Union centrifugal pumps, one powered by motor, the other by Elliott turbine.

Our Permutit water softeners and boiler feedwater treatment system were also connected in this temporary setup.

Our next step was the removal of one of the old boilers. As soon as it was out, the area was excavated, pilings driven, and the new foundations built. Then came the erection of the first new Babcock & Wilcox boiler, with the necessary steam header piping, breeching connections and feedwater piping. Here connections were made up to a point where they could be completed over a weekend while the plant was shut down anyway, and no loss of production was encountered.

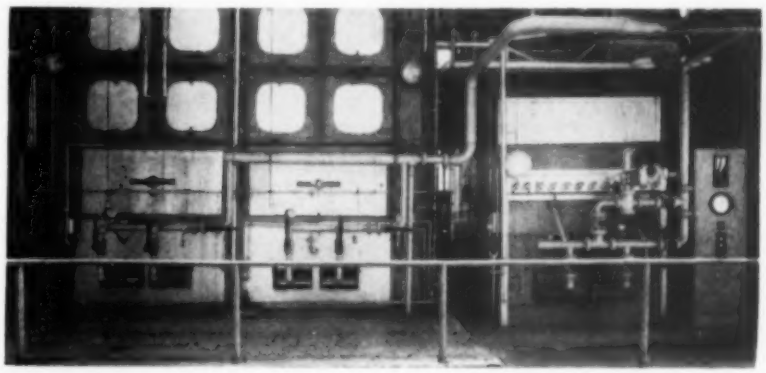
After the operating engineers at the New Orleans plant familiarized themselves with the new equipment, we dismantled the remaining two boilers.

For more than five months, while the two remaining boilers were being dismantled and the new one installed, the plant was without standby power, but again the operating engineer's staff at the New Orleans plant responded and there was no need to shut down the plant because of boiler failure, and there was no loss of production.

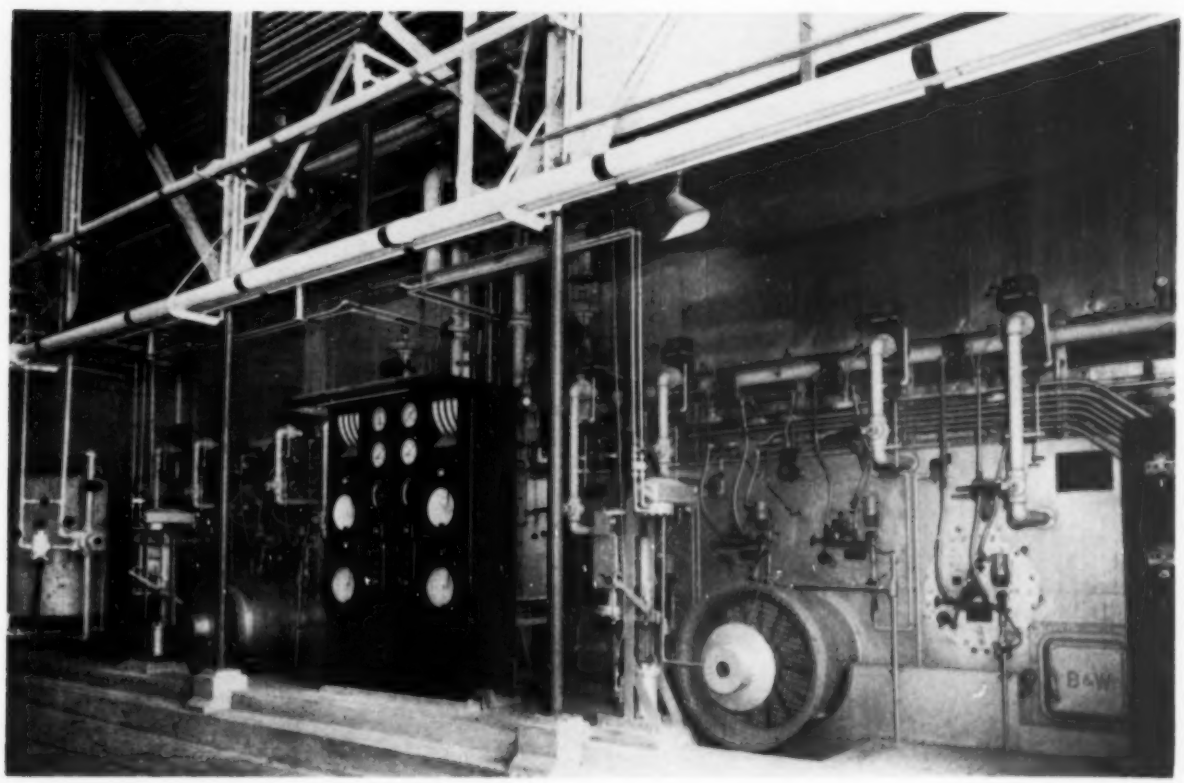
Each new boiler is equipped with four Babcock & Wilcox forced draft steam atomizing combination burners, which use gas, but will burn oil as an auxiliary fuel.

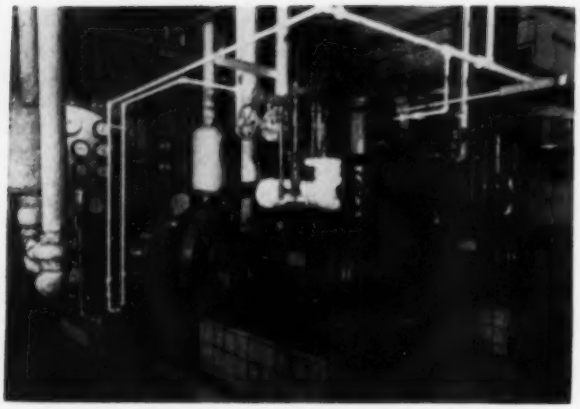
I shall omit reference to the complete Republic combustion con-

The boiler on the right was the first to be removed in the sequence of events described in the accompanying article.



The new Babcock & Wilcox boilers in place in Falstaff Brewing Corporation's Plant No. 4 at New Orleans. Between them is the Republic control panel. Although normally gas-fired, the combination burners can use oil if necessary.





Identical Vilter 11½-in. by 10½-in. twin-cylinder ammonia compressors. They are coupled by Elliott gear-reduction units to Elliott 2DYR steam turbines, operating at 3,240 rpm, 150 lb steam throttle pressure, 5 lb exhaust pressure, and turn at 360 rpm.

This Frick four-cylinder ammonia compressor also contributes to the overall refrigeration requirements of the New Orleans plant of Falstaff Brewing Corporation, set at 1000 tons a day. It is coupled direct to a 300-hp synchronous motor.

trol panel at this time to discuss it more fully under plant instrumentation.

Refrigeration Equipment

With the increase in productive facilities, aging cellars, and storage tanks, it became necessary to increase the refrigeration system by 425 tons, which now makes available 1000 tons of refrigeration daily.

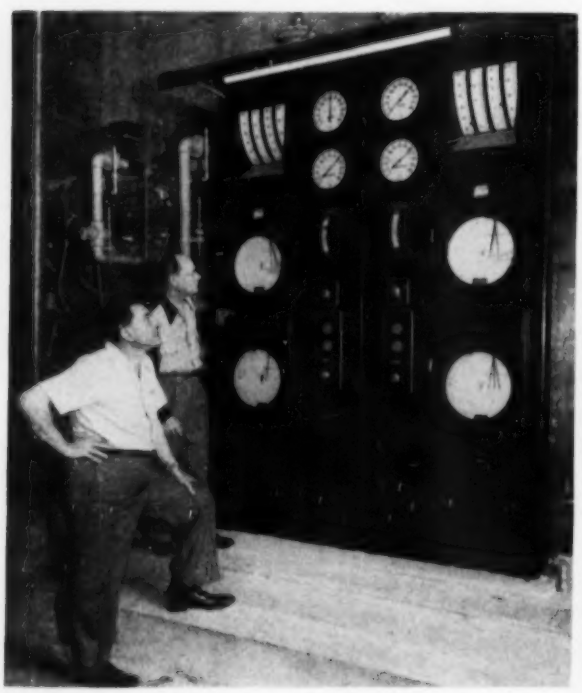
Among the new equipment installed were two 11½-in. by 10½-in. Vilter vertical twin cylinder ammonia compressors operating at 360 rpm. These were connected by Elliott gear reduction units to Elliott steam turbines, operating at 3,240 rpm, 150 lb steam throttle pressure and 5 lb exhaust pressure, and developing 159 hp each.

Additional equipment included an 11-in. by 10-in. four cylinder Frick vertical ammonia compressor driven by a 300 hp synchronous motor, and two 200 ton capacity horizontal shell-and-tube ammonia condensers. A new Marley induced draft cooling tower extension of 1500 gpm capacity, with a double-flow tower and settling basin constructed of redwood, was also added to the existing Marley induced draft tower of 3,000 gpm capacity.

A new liquid ammonia receiver, 36 in. in diameter by 14 ft long, was also added to the existing equipment.

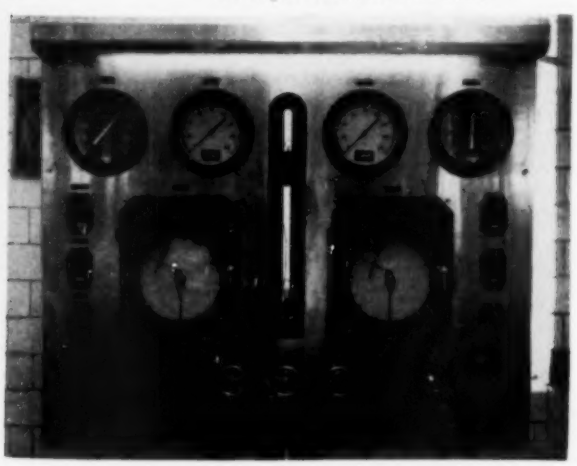
Exhaust steam from the steam turbines driving the Vilter compressors is used to heat process water, boiler feed water and for plant space heating requirements whenever needed. This gives a good heat balance throughout the plant and a very efficient operation, inasmuch as no live steam is

(*Continued on page* 94)



Chris Kaupp, left, chief engineer at the New Orleans plant, and George Holtzendorff, assistant, check the operation of the new boilers on the Republic control panel.

The brew kettle and lauter tub in one brewing line are both controlled from this one panel. All operations are recorded on Taylor recorder-controllers.



Improved Nailing-Gluing Method at Mengel's Louisville Plant

Output is more than doubled, waste is greatly reduced, a better joint is produced, and labor cost is reduced as much as 90 per cent.

THE MENGEL COMPANY of Louisville, Ky., which in six years has set an almost incredible record of becoming one of America's largest manufacturers of bedroom furniture, has developed an automatic nailing program which is cutting thousands of dollars a month from production costs—and resulting in better made furniture.

It is an example of how a heads-up company, beginning life 75 years ago making a few cigar boxes, has interwoven sound management, engineering, production know-how and merchandising to produce an annual business volume expected to approximate $50,000,000 in 1953. And while the company doesn't reveal sales figures on furniture, H. Keith Williams, vice president in charge of this fast growing division, said that a recently published estimate of "above $15,000,000" a year is not too high.

The company began developing its lower-cost nailing program after H. T. Riggs, former chief engineer and now assistant to the president, had his department conduct exhaustive tests on three methods of attaching slat bearers to bed rails.

Following long accepted practice in much of the industry, Mengel was using the costly and time-consuming method of preboring the bearers, then glue-attaching them with screws inserted by an automatic driver. Both Mr. Williams and Austin Sink, superintendent of the huge 12th Street Plant, had recommended use of a new type high speed nailer which cuts its own nails and drives them at a speed of up to three per second.

This machine, known as the Auto-Nailer and manufactured in Atlanta, Ga., by the Auto-Nailer

(*Continued on page* 79)

Dresser tops to which gallery rails have been glue-nailed with Auto-Nailer are stacked at the right. Operator is James R. Coffey. The top is turned over and auto nailed from underneath through the rail, thus leaving the rail perfect on top.

Up-to-the-minute mechanization in Georgia paint plant reduces physical labor to a minimum

HANDLING Wet and Dry RAW MATERIALS

Gravity flow, power and gravity conveyors, fork and platform trucks, and hydraulic lifts, features of Pittsburgh Plate Glass Company's new modern paint manufacturing plant in Atlanta, Georgia.

DEPARTING from multiple-story construction, which has been considered indispensable for paint manufacturing because of gravity flow requirements, Pittsburgh Plate Glass Company's new Southeastern paint manufacturing plant is essentially a single story, fireproof structure located on several levels.

It is situated on a 14 acre tract in the Empire Industrial Area of East Point, Georgia, approximately six miles from Atlanta. It is the largest paint manufacturing plant in the Atlanta area and one of the largest in the Southeast. Designed for rapid flow production of a complete line of paints, varnishes, enamels, resins, industrial and specialty finishes, the plant is the third ultra-modern paint producing unit to be put into operation by Pittsburgh Plate in recent years.

Originally rated to produce 1,500,000 gallons annually, the plant is designed to allow future expansion of production without structural changes.

Gravity Flow

The 130,000 sq ft plant is designed to provide several functional levels to provide the essential gravity flow requirements of manufacturing operations. A mezzanine floor is incorporated for grinding and straining. Ball and pebble mills are suspended on structural

Tank storage farm has capacity for 250,000 gallons of liquid raw materials which are pumped to point of use by remote control. Tanks of 20,000 and 25,000 gal capacity were fabricated by the Birmingham Tank Company. At the right, pallet loading of all dry materials and of packaged products speeds movements around the plant on fork trucks. Note safety canopy over operator.

MATERIALS HANDLING BRIEF

Tanks—20,000 and 25,000 gal capacity exterior tanks supplied by Birmingham Tank Co. Numerous thinning, tinting, blending and storage tanks supplied by the J. J. Finnigan Co., Atlanta, Ga.

Scales—Twenty warehouse, counter, and processing scales from 4,000 to 10,000 lb capacity, supplied by Fairbanks, Morse & Co.

Pumps—Fifteen miscellaneous pumps of 25 to 90 gpm capacity furnished by Fairbanks, Morse & Co.

Conveyors—Power conveyors for all filling and allied operations furnished by the Logan Co. Gravity roller conveyors for handling finished goods supplied by E. W. Buschman Co.

Trucks—Hydraulic lift trucks, mechanical hand lift trucks, and elevating platform trucks supplied by Yale & Towne Mfg. Co. Battery powered Clark fork trucks supplied by Materials Handling Equipment Co., Clark distributor.

steel frames beneath the upper decking with easy access from above for charging raw materials.

Tank farm storage at the rear of the plant provides a reserve for 250,000 gallons of liquid raw materials which are pumped to manufacturing points of use by a remote control system.

Logan Co. power conveyors handle cans and cases while E. W. Buschman Co. gravity roller conveyors are used for finished goods. Other handling equipment includes Yale & Towne Mfg. Co. hydraulic lift trucks, mechanical hand lift trucks and a low lift elevating platform truck. A Clark battery powered fork truck is also employed.

Other Features

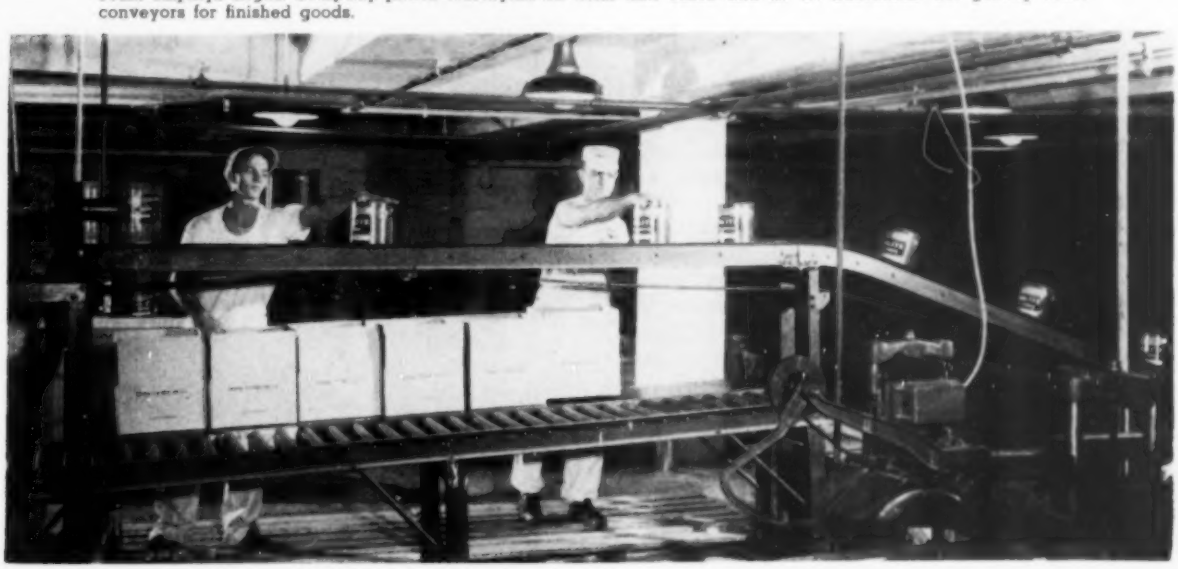
Two 150 lb capacity Cleaver-

(*Continued on page* 98)

Liquid raw materials from the tank farm (shown on opposite page) are drawn by remote control and weighed off for the batch process. Fairbanks, Morse & Co. scales are used extensively in the plant. Majority of processing tanks in the plant were manufactured by the J. J. Finnigan Co., Atlanta, Ga.

Yale & Towne Mfg. Co. platform truck easily transports a 600 gallon batch of paint from one level to another. Battery operated truck is moving portable tank into the elevator at the rear.

Cans move along conveyor from filler line to packers who put them in cartons which are mechanically sealed. Plant employs Logan Company power conveyors for cans and cases and E. W. Buschman Co. gravity roller conveyors for finished goods.



We must develop a strong and stable America as the

Price of Survival in a

By A. LEE M. WIGGINS
Chairman, Atlantic Coast Line Railroad Co.

SHORTLY after President Eisenhower returned from Korea, a taxi driver in New York assured me with apparent satisfaction that everything was going to work out all right. Many observers agree that following the election there was a remarkable change in public attitude toward our domestic and international difficulties, and a greater confidence that our problems were on the way to being solved.

Public support of a new approach to our problems, national and international, under new leadership, was a most heartening development of the recent election. New hopes were raised and faith strengthened that we will be able to preserve and multiply freedom in a world that is threatened by enslavement and human degradation, without the catastrophe of an atomic war.

However, any complacency about present conditions and the prospects ahead constitutes a most dangerous attitude for the future well being and safety of this nation and for the preservation of freedom among men. The facts are that the further along we get in the struggle between freedom and communism, the more difficult becomes the task of preventing the spread of communism and the further away the time schedule for effective results reaches into the future. In the meantime, the possibility of an all-out war, starting accidentally in one of the many powder kegs around the world or by design of the communists, is a continuing and ever present threat.

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Larger quantities will be supplied at cost, 3c each.
W. R. C. SMITH PUBLISHING COMPANY
806 Peachtree St., N.E., Atlanta 5, Ga.

An Easy Way

For the past two decades, we have sought the easy way out of our national difficulties. We have tried to find pleasant and comfortable answers to our problems through the use of government deficits, artificial price raising, legislative wage raising, the multiplication of dollars, the redistribution of wealth through taxation and inflation, government guarantees and subsidies, easy money policies that encouraged the creation of debt, and many other substitutes for sacrifice and hard work.

Most of these things were done in the name of social progress and reform. It was a pleasant one-way street. We were headed toward what appeared to be Utopia when World War II brought the threat of fascist domination of the free world.

Tragic Mistakes

We mobilized our resources and leadership and attempted to purge the world of the virus of fascism which we thought at the time was the only serious threat to freedom. In this we were tragically mistaken. We were led to extend a friendly hand to a war ally who has now become a greater enemy to freedom than Germany ever was. This former ally has now embarked on a program to conquer and enslave the entire world by means of aggression and subversion.

The tragedy is that some of the spread of communism should have been accelerated on the wings of what was considered liberalism. Subversive elements were found in high places in our own government, hiding under the protective cloak of pseudo-liberalism and social reform. Even men of sincere good will were completely deceived.

Leaders in America and throughout the world

Danger-Filled World

No. 4 of a series on problems of business and government

could not believe the ghostly spectre of what they feared. Appeasement and compromise seemed at the time to be the only policies that would avoid a conflict which might engulf civilization. We were literally taken for a ride—leaders of state and common citizens alike—in this country and throughout the world.

The free nations liquidated the greatest military machine on earth at the end of World War II, while communist nations multiplied their military power. Too late we discovered that the military might of communist aggression, augmented by subversion, threatened the world. Too late we discovered that there is no compromise between freedom and slavery, between truth and lies, between God and materialism.

And so, today, we find this nation in the role of leadership, desperately seeking to multiply the strength of free peoples throughout the world in order to save as much as possible of what is left from the communists and to meet successfully what may be civilization's greatest struggle to preserve freedom.

World-Wide Revolution

Only now are we beginning to discover the full import of the social, political and economic revolution that has erupted with increasing fury throughout the world. We are witnessing bitter struggles among fiercely antagonistic groups in many nations, millions of people in revolt, seeking a new and better way of life. World-wide communication, particularly radio, continuously reveals to the most isolated communities throughout the world achievements and satisfactions that inspire people everywhere to a

MR. WIGGINS, one of the South's most successful business executives, has had a notable career also as a banker and a newspaper publisher. Here are just a few of his many and varied business connections: Chairman of the Board, Atlantic Coast Line, Louisville and Nashville, and affiliated railroad companies; president and chairman, Atlantic Coast Line Co.; president, Trust Company of South Carolina; president, Hartsville (S. C.) Publishing Co.; director, American Telephone & Telegraph Co. He is a past president of the American Bankers Association, Southern Retail Merchants Conference, South Carolina Press Association, and many similar organizations. He has served as treasurer of the American National Red Cross, member of the Federal Reserve System's Advisory Council, and Under Secretary of the U. S. Treasury.

(Price of Survival Continued)

new hope for a better life. Mankind is on the march —destiny unknown.

The disillusioned peoples of many nations are ripe for the painted allurement of communism. Discontent with low economic and social status and racial prejudices provide the ferment in which communism flourishes. Governments based on oppression and poverty for the multitudes and power and privilege for the few are disintegrating throughout the world.

A More Positive Approach

Our first objective was to prevent the further absorption of peoples and nations by the communists. It found expression in military action in Korea. For the most part, it is being carried out through a program of economic and military aid to countries that have demonstrated a desire and capacity to fight communism. Though successful in large measure, this policy has failed in some countries because of our ineptness and a question as to our motives.

Whatever the success or failure of these initial efforts, we should re-examine and re-appraise them. We should now move to a more positive approach in which our efforts will be attuned to the aspirations and needs of particular countries. Our motives should be clearly revealed as being primarily to help people who want to preserve the freedom they have and are trying to achieve a more productive and more satisfying social, economic and political order under freedom.

Another objective has been to further mobilize and multiply the military and economic strength of free people so as to prevent the communists from overrunning other parts of Europe and Asia as well as to form the base on which military success can be achieved if the communists resort to war. Here again our approach should become more positive, our objectives clearer and our motives defined in terms of preserving freedom and multiplying the opportunities for a better life for the peoples of cooperating nations.

Our task is to convince the rest of the world that our motives are to promote freedom for all as well as to preserve it for ourselves.

Until now, our objectives and methods have been largely of an emergency nature. We have adopted temporary expedients. We now face the tragic necessity of living dangerously in a danger-filled world for the foreseeable future. The greatest peril of all would be a complacent feeling that the situation will work out all right. We need to sustain courage of a high order in the presence of uncertainty as to the plans of the Kremlin.

We would like to find an easy and comfortable way out of this threat to our way of life and to the society of free men. We would like to pull the cover up over our eyes and blot out the ghastly prospect; but it is there, a reality and not a bloody nightmare.

Harsh Realities

Three unpleasant realities confront us: (1) that the communists have brought under their domination and control a large part of the world and are now attempting the conquest of the entire world; (2) that this country is cast in the role of world leadership, the exercise of which may determine whether an all-out military war may be prevented or, if it comes, may be won; and (3) that the clash and struggle of freedom vs. communism will go on and on for the indefinite future.

Recognizing the necessity for making long-range plans in the exercise of this leadership, part of our present task is to evaluate our own internal strength and weakness and prepare for the long pull. We should recognize that a large part of the financial and economic burden of this conflict has fallen on the United States and that the health of our economy has a profound effect throughout the world.

The success or failure of governments in many countries to remain free from communist domination will depend not only on our direct help but in some measure upon the financial stability of this country and our avoidance of inflation or deflation. World progress and stability at the present time are more closely tied to the integrity of the American dollar than ever before.

Areas of Weakness

Evidences of financial and economic strength in this nation are well recognized, but our weaknesses have been obscured by the rapid developments of the past two decades. There are several areas of economic weakness, actual or potential, that have developed in recent years which require examination and evaluation and where positive national policy and action are needed. Attention is directed to five of these areas:

Inflation—Deflation

(1) In certain segments of the economy, inflation since 1940 has confiscated a substantial part of our wealth. During this period, the cost per unit of production has increased nearly 100%, while the physical volume of goods and services has increased only two-thirds as much. A dollar at the present time will buy only what 53¢ of the same dollar would have bought in 1940. The full impact of the destruction of part of our dollar wealth by inflation is yet to be felt in our economy.

While some increase in the dollar supply has been necessary to serve increased production, the excessive increase has resulted in the wasting away of nearly half of the value of the dollar within a twelve-year period. However, any precipitate decline from the present plateau of prices and wages through deflation would be disastrous. On the other hand, further inflation would be explosive.

We are caught at a point where reasonable stability with a minimum movement either way appears to be the only hope of avoiding disaster. Whether we have the capacity, as well as the political and moral courage, to steer the economy on a reasonably even keel between inflation and deflation becomes the number one question in domestic, as well as in world economic affairs. Required are sound fiscal and tax policies, proper monetary and credit control

and judicious management of the public debt, all backed by a determined administrative and legislative policy of government.

Controlling the Budget

(2) We find ourselves with a government debt unparalleled in amount and proportions and a federal budget around the $80 billion level and not balanced with revenue. Taxes of all kinds absorb some 30% of total national income. We appear to be stretching to the limit the capacity of our economy to service government. We have been able to withstand this burden in part through the confiscation of part of our dollar wealth and through eating up some of the "fat" previously accumulated.

Further government expenditures are projected near the current rate. How long and to what extent our domestic economy can stand such a drain without producing dangerous cracks remains to be seen. We can avoid this danger by bringing the budget down to manageable proportions and at the same time meeting defense needs and maintaining a stable economy. Such a program is believed by competent students to be possible if vigorously pursued by leaders in government and properly supported by the public.

Threats to Corporations

(3) Part of the accumulated "fat" of our economy is being consumed through a capital levy on our productive machine, a combined product of inflation and the tax structure. Depreciation charges on productive plant and equipment provide only one-third to one-half of the reserves required to replace such facilities. The remaining part of the cost of such replacement constitutes, under our tax laws, a capital levy. Such replacement must be provided by new capital or borrowed dollars or out of earned net income.

Net income in the case of corporations is income that is left after paying Federal income taxes of 52% to 82%. Many corporations that show a net income after taxes would show little, if any, net income if the full dollar replacement costs of depreciation of plant and equipment were charged as an expense. In addition, this unrealistic and inflated net income of corporations after taxes becomes subject to a graduated income tax when distributed to individual share owners.

The net result is that share owners in many corporations receive little, if any, economic net gain from their investments in common stocks. The incentive to corporate share ownership is becoming weaker and, in time, the corporate form of enterprise will begin to disintegrate unless there are changes in our tax laws. The corporate form of business is the foundation of the private enterprise system. The alternative is nationalization.

Social-Economic Programs

(4) Within the past two decades, this country has embarked on many programs with social-economic objectives, the full impact of which cannot be measured as yet. Some of these programs are socially desirable and represent human progress. Others fit into the pattern of state socialism.

Subsidies and payments by government under some of the programs have no sound economic basis and represent a financial drain on the taxpayer without a compensatory public benefit. As illustration: a large part of the billions of dollars of tax money that has been spent in the name of improved waterways and the development of electric energy, represents a perversion of sound economic theory for the benefit of favored groups and to the hurt of others.

The increasing heavy drain on the Federal Treasury from social-economic outlays at a time when budgetary needs strain the financial capacity of Government requires a re-examination and re-evaluation of them in terms of costs to the taxpayer as compared with resulting public benefits. Political courage of a high order will be required to reduce or discontinue many of these programs. Some of them are political dynamite.

Industrial Warfare

(5) As we strive to find answers in our quest for world peace, we should also attempt to discover a substitute for labor-management wars that imperil the national welfare. A strike or lockout is a form of economic war. Use of force to resolve economic issues seldom yields a fair and just result. As labor-management relations in this country reach maturity, there will come a measure of our capacity and intelligence to find in reason and justice a substitute for economic warfare.

The giants on both sides in such contests have at their mercy the welfare of the American people and sooner or later will come a test in which the rights of all of the people must be recognized as supreme over the rights and power of any economic group. Economic warfare can destroy the foundations of the private enterprise system and democratic government. Ways of peace must be found to replace the losses and hardships of industrial warfare.

I would say, in conclusion, that the hour for temporary expediency in our national life has passed. We should now look beyond the horizon. Our peril is great and danger may be nearer and greater than we think. We must develop our full strength, military and economic and also moral and spiritual. We should gird ourselves not only with military might but with the courage to act on the basis of moral convictions that spring from spiritual resources. We should promptly eliminate any serious weaknesses in our national life, actual or potential.

Our new President brought a timely challenge to American leadership when he said shortly before Christmas 1952: "It is my conviction that the great struggle of our times is one of spirit. It is a struggle for the hearts and souls of men . . . it is a contest for the beliefs, the convictions, the very innermost soul of the human being."

No. 5 of this series
Let's Bring Government Back Home
By Allan Shivers
Will be in the April issue of SPI

Power and Steam Equipment

Bowaters Paper Mill, Calhoun, Tennessee

Steam will be supplied by three types of boilers burning three separate fuels. Generation from two extraction turbines will be supplemented by purchased power.

THE initial design capacity of the Bowaters Southern Paper Corporation mill has been made for the production of 125,000 tons of newsprint per year, and 50,000 tons annually of either unbleached or bleached kraft pulp for sale.

The newsprint production will require daily approximately 360 tons of pine groundwood and 120 tons of bleached kraft pulp, with the total kraft pulp requirements, including that for sale, being approximately 312 daily tons.

The daily chemical consumption generally will be approximately 20 tons of salt cake, 10 tons of caustic, and from 8 to 18 tons of chlorine, and 16 tons of lime. For the news furnish 5400 gallons of 36 Baume liquid alum will be used, and 1200 gallons for water treatment, with required quantities of sulphuric acid and other chemicals for slime prevention, color, etc.

A total volume of 906 cords of pine per day will be used. It will be shipped by river barge, railway, and trucks.

The plant will employ approximately eight hundred workers at the mill, and several hundred more to supply pulpwood. Approximately three and one-half million dollars will be paid annually for wages at the plant, and a similar amount—or more—in connection with the wood supply.

Power Plant

It is estimated the total electrical load under normal operating conditions will approximate 37,000 kw with approximately 17,000 kw supplied from the TVA system, and 20,000 kw from the mill turbo-generators. Of the total kw load, approximately 20,000 kw will be utilized in the wood grinding operations.

To supply the steam requirements of the mill and 20,000 kw of its electrical requirements, a topping cycle has been chosen for the power plant. Basically the plant will operate on a regenerative 2-heater cycle, with makeup varying between 20 and 50 per cent.

Steam Generators

A careful economic study of the proper primary steam pressure and temperature to use has resulted in the selection of 875 psig and 825 F. One of the limiting factors in the determination of this pressure is the location of the mill in the low cost TVA power region.

Steam at this pressure and temperature will be produced in one recovery boiler, one bark burning boiler, and two power boilers.

Recovery Boiler

The chemical recovery unit for the burning and reducing of the dry solids contained in the black liquor will be furnished by Combustion Engineering-Superheater, Inc. This unit will have capacity sufficient to burn 950,000 lb of solids per 24 hours; with a steaming capacity of 123,200 lb per hour at 875 psi and 825 F from the feedwater at 280 F.

Preliminary evaporation on the unit will be through a cascade evaporator, with wheels 14 ft diameter by 9 ft 6 in. face. Both forced and induced draft fans will be driven by motors, the latter having a hydraulic coupling for speed control.

For the soot blowing, an air puff system will be furnished for the collector zone and the economizer passes, consisting of sixteen heads automatically controlled for sequential operation. In addition there will also be twelve Diamond retractable soot blowers for the clearing of the screen tubes and superheater elements, all arranged for double side installation at six locations. These units will be air operated with saturated steam for the cleaning medium.

For the handling of salt cake a pneumatic system will be used to unload cars and deliver either into storage or the feed hopper of the unit.

For the recovery of salt cake and dust in the flue gases, a Western precipitator is to be furnished and installed as an integral part of the recovery building above the cascade evaporators. The unit will consist of two Cottrell electrical precipitators enclosed within a shell structure of combined hollow tile, steel, and reinforced concrete. Each of these units will have an individual stack and will be so arranged that with one of these units down, the other can still be maintained in operation.

Bark Burner

The Combustion Engineering bark burning boiler will be capable of producing 125,000 lb of steam per hour, with either bark or natural gas firing. Under normal anticipated conditions there will be

Staff prepared from data furnished by K. O. ELDERKIN, General Manager, Bowaters Southern Paper Corporation, and D. G. MOON, J. E. Sirrine Company.

Bowaters Southern Paper Corporation
Calhoun, McMinn County, Tennessee

This new plant, scheduled for operation in 1954 will make 125,000 tons of newsprint and 50,000 tons of kraft pulp per year.

The plant will employ 800 workers and several hundred more will be needed to provide pulpwood. Aproximately 3½ million dollars will be paid annually for plant wages and a like amount will be expended for wood.

Chemicals used daily will include: 20 tons of salt cake, 10 tons of caustic, 8 to 18 tons of chlorine, 16 tons of lime, 66,000 gallons of 36 Baume alum, and appreciable quantities of sulphuric acid.

A preliminary history of early planning and design progress appeared on page 116, Southern Power & Industry for February.

enough bark to maintain about a 68,000 lb per hour steam load. Only when one of the power boilers or the recovery boiler is out of service is it intended to fire natural gas in the bark boiler for additional steam. This boiler will be equipped with a Combustion Engineering traveling grate and spreader stoker for bark, and tangential burners for natural gas. The boiler section will be a straight through no-baffle type.

In front of the bark boiler above the firing aisle will be a Miller-Hofft bark storage bin of 6000 cu ft capacity. Bark will be fed from this bin into the spreaders by screw conveyors placed across the bottom.

Power Boilers

Each of the power boilers (provided by Combustion Engineering-Superheater, Inc.) will be of 150,000 lb per hour capacity and will be fired primarily by natural gas, with provision for Bunker "C" fuel oil firing during periods of natural gas shortage. Under normal circumstances these boilers will share whatever load is required in excess to the bark and recovery production. In laying out the present auxiliary equipment for these units, provision has been made for the possible future addition of coal bunkers and pulverizers. The furnaces will be provided with hopper bottoms to permit the use of pulverized coal without changes to the unit proper. Soot blowers are by Diamond Specialty Company, and fans by American Blower Company.

A complete fuel oil burning system will be provided for secondary fuel operation of the power boilers. This will include a main oil storage tank, a day tank, an oil pumping and heating set, and the necessary oil guns.

Turbo-Generators

In order to obtain topping power from the process and heating steam, two General Electric turbo-generators of 10,000 kw capacity each have been chosen.

Turbine No. 1 will have throttle conditions of 850 psig and 825 F. It will have automatic extraction at 50 psig, and a Westinghouse condenser for 2½ in. Hg.

Turbine No. 2 will be of the same throttle conditions, with automatic extraction at 150 psig and 50 psig back pressure at its exhaust.

Steam Distribution

Two steam pressure levels are needed for the mill facilities. They are 150- and 50-psig. Extraction and exhaust steam taken from the turbines will be fed to 150- and 50-psig headers, respectively. From these headers steam will be taken for the mill and for whatever station service is required. Desuperheaters will be located in the mill take-offs to reduce the temperature to just above saturation.

Linking the 850-, 150-, and 50-psig headers will be lines containing pressure reducing stations.

Within the power house there will also be a 5-psig header, with a bypass connection from the 50-psig header. Steam for the No. 1 feedwater heater will be taken from the 5-psig header.

Feedwater System

Makeup water will be added to the condensate storage tank along with the mill returns and condenser hot well returns. The makeup will vary between 20 and 50 per cent of the total feedwater flow, depending on the operating conditions. Just prior to entering the condensate tank the makeup water will go through the blowdown heat exchanger.

A condensate pump (with a standby pump) will take water from the condensate tank and pump it to the deaerating heater, which will operate at 5 psig. This heater will be of the horizontal, tray type, capable of reducing the oxygen content to 0.005-cc per liter.

Water at approximately 228 F will leave a Graver Water Conditioning Corporation deaerating heater and will fall to the boiler feed pumps. The feedwater pump will raise the water pressure to approximately 1080 psi, which will be sufficient to carry the water through the No. 2 heater (Lummus Company, closed type), through the feedwater control valves and into the boilers.

The No. 2 heater will receive steam from the 50 psig header in order to heat the feedwater to 280 F. The condensate from this closed heater will be discharged directly into the open heater.

The feed pump station will consist of three Ingersoll-Rand identical pumps, each rated at 1200 gpm and 2500 ft head. The principal pump will be driven by a steam turbine and an electric motor. The other pumps will be motor driven only and intended for standby service.

The turbine drive for the feed pump will receive steam from the

150 psig header and discharge it to the 5 psig header, which in turn will supply steam to the open heater. A back pressure regulator will control the flow of steam to the turbine, which varies the amount of pump load that the turbine can handle.

To keep the pump up to speed, the motor connected to the other extended shaft of the pump will take up the remainder of the load. Normally, this motor drive will be lightly loaded or just floating on the shaft, but whenever the flow of steam falls below that required for full pump power, the motor will pick up load.

The feedwater flow will include that which is necessary for steam production, plus approximately 1 per cent for continuous blowdown. The blowdown will be flashed in two tanks, one at 150 psig and the other at 50 psig. This flash steam will be piped into the corresponding headers.

Controls

The control of the recovery boiler will be essentially manual with the exception of a furnace draft control which will operate the induced draft fan hydraulic coupling. The rapping cycle of the electric precipitator will be automatically controlled.

The bark boiler will be fired by manually controlling the feeder screws. An oxygen transmitter will be used to control the amount of overfire air, and a furnace draft transmitter will control the induced draft damper.

In addition to the above controls the bark boiler will have air flow—gas flow controls for the firing of natural gas from the tangential burners.

The power boilers will be primarily controlled by a steam pressure transmitter which will be operated by main steam header pressure. This will enable the power boilers to produce whatever steam is required above the production of the recovery and bark units.

The power boilers will have automatic controls for the firing of either natural gas or Bunker "C" fuel oil.

All of the steam generators in the plant will have automatic three-element feedwater controls.

All automatic controls can be operated manually when required.

Air Compressors

To supply mill and station compressed air, two Ingersoll-Rand compressors will be installed. One of these will be in the turbine room and the other in the mill. These compressors will operate at approximately 110 psig and supply all of the plant's service air requirements.

An air compressor will be located in the turbine room for use by the recovery boiler air soot blowers. This compressor will discharge at 350 psig and have a storage tank of suitable volume to permit full extension and retraction of any one of the soot blowers.

For instrumentation air, one instrument air compressor will be located in the turbine room and another in the mill. The two compressor receivers will be joined by a suitable pipe so that they will both be available for either mill or power instrument use. On the outlet connections of these receivers will be air dryers. The instrument air compressors will be of the "carbon ring" type so as to not introduce oil into this system.

Electrical Equipment

Electric power will be supplied at 13,800 volts, 3 phase, 60 cycle, and distributed throughout the plant to unit substations for conversion to utilization voltages. In general 460 volts will be used for motors up to 200 hp capacity, 2300 volts for motors from 200 to 1000 hp, and 4160 volts for the 4500 hp grinder motors.

The primary distribution system will consist of two principal elements, with an interconnecting tie circuit. One element, to be supplied from the TVA system, will serve the groundwood area in which will be located two 15,000 kva, 3 phase transformers and two 750 kva unit substations for power supply to eight 4500 hp unity power factor, 4160 volt synchronous motors to drive the grinders, together with 440 volt motors driving auxiliary equipment. The second element, which is to be supplied from two 10,000 kw turbo-generators in the power plant, will serve the woodyard, pulp mill, bleaching, stock preparation and paper machine areas.

Each turbo-generator will be connected to a main bus from which feeder circuits to the various areas emanate. Both turbine driven generators and the TVA system are inter-connected through a synchronizing bus with complete system control located in the power plant.

Primary control equipment has been selected on the basis of continuous current rating together with the short circuit kva available at the point of utilization; and the whole coordinated to a 500,000 kva level. This coordination has been extended in the selection of unit substations to permit the use of 150,000 kva high interrupting capacity motor starters for the 2300 volt motors, and combination magnetic starters in motor control centers for the 440 volt motors. With one or two exceptions, the unit substations have thus been limited in capacity to 3000 kva and 750 kva, respectively.

Use of unit substations together with low voltage motor control centers practically eliminates any low voltage power distribution. In the case of 2300 volt equipment, the motor starters form the low voltage section of the substations; hence the motor loads constitute the 2300 volt wiring. For the 440 volt wiring, there are only short stub feeders to the motor control centers and the motor loads make up the bal-

PERSONNEL

The Bowaters Organization filed application for a Certificate of Necessity on May 25, 1951, which was approved February 19, 1952, and immediately thereafter the J. E. Sirrine Company was authorized to proceed with the final design plans and arrange for purchase of equipment, site preparation, and construction contracts.

Associated with J. E. Sirrine Company will be Celli-Flynn of McKeesport, Pennsylvania, for the preparation of the architectural treatment of the mill and the design of the facilities building; also Mr. Willie Saint-Laurent of Montreal, Canada, will assist as a consultant in respect to the wood handling.

The immediate personnel of the Bowaters organization resident in the vicinity of the site and who will supervise operations are: K. O. Elderkin, General Manager; V. J. Sutton, Mill Manager and Assistant to the General Manager; C. E. Opdyke, Comptroller and Treasurer; D. W. Timmis, Secretary and Assistant Treasurer; A. W. Bentley, Woodlands Consultant; George R. Koons, Manager of Industrial Relations; R. B. Reid, Purchasing Agent; and M. J. Osborne, Electrical Engineer.

The officers of the company are: Sir Eric V. Bowater, President; A. B. Meyer, Vice-President; K. O. Elderkin, Vice-President; C. E. Opdyke, Comptroller and Treasurer; D. W. Timmis, Secretary and Assistant Treasurer.

ance. Local control of the motors will be by push button stations placed at the machines with the individual starters in isolated control rooms along with the unit substations.

Motor applications throughout the plant will be in general of the conventional type and will require only standard equipment. However, the grinder motors will be enclosed with built-in air coolers to minimize the ventilation problems of the grinder room, and each of the paper machines will be driven with an electronically controlled adjustable speed variable voltage sectional drive, including multiple generator motor generator sets, and 500 volt d-c adjustable speed enclosed separately ventilated section motors.

The plant lighting system will be sectionalized according to departments and locally controlled. In some areas Mercury Vapor-filament combination lighting will be used, and in others incandescent; selection depending upon the process, atmospheric and structural conditions. Power for the plant lighting will be obtained from the 750 kva unit substations of the general power system and distributed at 460 volts to the area centers where it will be transformed to 115/230 volts for the lighting units. Illumination intensities will vary in different sections of the plant, but will be commensurate with the requirements of each area.

Principal items of electrical equipment are being furnished by General Electric Company, Westinghouse Electric Corporation, and Reliance Electric & Engineering Company.

Water Supply and Treatment

The raw water for plant uses will be obtained from the Hiwassee River about two and one-half miles from the plant site. Vertical submerged type raw water pumps will be used, three pumps being contemplated for the initial installation. These pumps will have a capacity of 6000 gpm each, or a total of 18,000 gpm. The raw water will be pumped through 12,000 feet of 36 in. steel pipe, lined and coated, to a treating plant located on a hill above the plant site.

The treating plant will be a modern gravity type filtration plant utilizing flash mixing, mechanical flocculation, settling and rapid sand filters. The clear well for the plant will consist of an open, sloping side, concrete lined reservoir with a capacity of four million gallons.

The rated capacity of the water treatment plant is 25 million gallons per day.

The lower section of the clear water storage reservoir will be reserved for fire protection. Due to the elevation of the clear water reservoir, a gravity flow will be obtained to the mill; consequently, no service water pumps will be required at the treating plant.

Waste Disposal

The waste disposal system contemplated for the mill will consist of a pump house for elevating the process waste to a primary settling basin of 140 acres. Secondary treatment will be obtained in a large disposal reservoir with a detention capacity of approximately thirty days for the entire mill process waste. The sludge from the primary settling basin will be pumped to a permanent disposal area of twenty-five acres, located in a ravine on the mill property. The primary settling basin for the disposal plant will consist of an earth lined reservoir, sloping sides, with mechanical rotary type sludge collector. The system is laid out for an addition of future units in the event the mill capacity is later increased.

Piping and Instruments

Plain black steel pipe will be used throughout the digester, wash room, and recovery area; also for the feedwater and hot condensate service.

In general, transite pipe will be used for all stock and white water piping after the washed stock storage chest and for the groundwood and stock furnish up to the fan pump of the paper machine. From the fan pumps to the machine and for the overflow from the screens, stainless steel pipe will be used.

For the chlorination stage of the bleach plant, rubber lined pipe will be used with Saran lined pipe for bleaching liquor and lead for chlorine gas.

For throttling and shutoff service on stock lines, Crane stock valves will be provided. On black liquor in the washing and digesting system, lubricated plug cocks will be used.

The mill will be adequately supplied with control instruments, and in general the controls for the various divisions of the mill will be mounted on panels centrally located on the operating floor.

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So much interest has been expressed in SP&I's "Better Government" series (see No. 4, page 56 in this issue), that we are offering reprints in limited numbers free to our readers in the South and Southwest. Reprints of the following are now available:

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Annual INVENTORY Technique at LeTourneau—Texas Division

By C. MELVIN BROOKING
Chief Industrial Engineer, R. G. LeTourneau, Inc., Longview, Texas

PROBLEM—Items covered in the inventory included production work in process, finished manufactured parts, finished equipment, used equipment, experimental equipment, tires, purchased parts, miscellaneous supplies, all engines (not assembled in any equipment), raw materials (steel, pipe, etc.) and paper stock.

Items not inventoried included capital equipment (manufacturing machinery and equipment), major tools capitalized on the books, office machines and office equipment, jigs, dies, and fixtures, and all supplies charged out of inventory on requisitions.

METHOD—Success of the Annual Inventory at the R. G. LeTourneau, Inc., Longview, Texas, plant is attributed to:

1. Long range planning—plans which originated a year ahead of time.

2. A good organization with each member knowing exactly what his responsibility was and what was expected of him.

3. An inventory manual outlining all plans and procedures.

4. Training program including supervisory education and on-the-job instruction for the actual crews.

5. Pre-inventory work—accomplishing everything that could be done prior to inventory day.

6. Complete understanding and cooperation of all inventory personnel.

7. An adequate inventory inspection section that assured us an accurate and complete inventory.

RESULT—Complete annual physical inventory valued in excess of $5 million, taken with a production loss of only half a day.

AN INDUSTRIAL plant inventory must be taken in the shortest possible time and often with a large number of personnel, many unfamiliar with inventory taking methods. In addition, the results must be accurate. These factors require that considerable planning and organization go into the inventory program.

The complete annual physical inventory of our Longview, Texas, plant, valued in excess of $5 million, was taken with a production loss of only half a day. Inventory took a full day but was scheduled on a Saturday, only a half working day.

Early Planning

Our ability to complete this inventory in a single day is the result of careful planning and organization. The planning for the inventory began a year ahead—immediately after the completion of the previous physical inventory.

Initial effort was to check with all supervisory personnel that handled the previous inventory on particular problems encountered and their suggestions for eliminating these difficulties. These suggestions were kept on file for use by the inventory committee in planning the next inventory.

Six months prior to the actual inventory date, the committee was organized from the Accounting, Engineering, Production Control, and the Industrial Engineering Divisions. Each member was assigned a definite responsibility for one phase of the planning and direction of the inventory—see tabulation *General Organization for Inventory*. The Chairman of the committee then called a meeting approximately every three weeks to check on the progress of the work being planned.

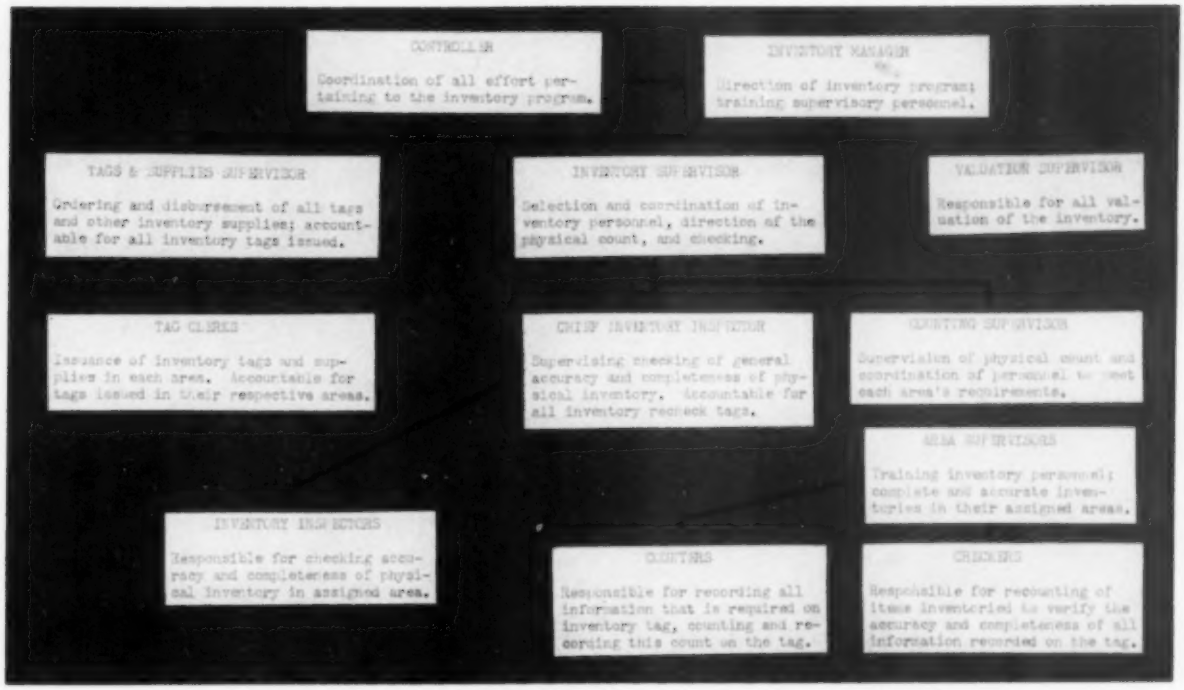
Training

In former years, we attempted to train all personnel involved in the inventory prior to inventory day. Reviewing procedures with small

"Inventory Manual"—Basic Tool of the Operation

The Company's INVENTORY MANUAL is one of its most valuable tools. Considerable time and effort were involved while developing the manual several years ago. However, in each succeeding year only a small amount of time is spent in bringing it up to date.

The manual contains complete inventory maps of inside and outside areas; general organization chart and responsibilities; general inventory plans; pre-inventory check list; check sheets; detailed procedures for each classification of material; inventory tag procedures; and complete minutes of all inventory Committee Meetings.


CONTROLLER
Coordination of all effort pertaining to the inventory program.
INVENTORY MANAGER
Direction of inventory program; training supervisory personnel.
TAGS & SUPPLIES SUPERVISOR
Ordering and disbursement of all tags and other inventory supplies; accountable for all inventory tags issued.
INVENTORY SUPERVISOR
Selection and coordination of inventory personnel, direction of the physical count, and checking.
VALUATION SUPERVISOR
Responsible for all valuation of the inventory.
TAG CLERKS
Issuance of inventory tags and supplies in each area. Accountable for tags issued in their respective areas.
CHIEF INVENTORY INSPECTOR
Supervising checking of general accuracy and completeness of physical inventory. Accountable for all inventory recheck tags.
COUNTING SUPERVISOR
Supervision of physical count and coordination of personnel to meet each area's requirements.
AREA SUPERVISORS
Training inventory personnel; complete and accurate inventories in their assigned areas.
INVENTORY INSPECTORS
Responsible for checking accuracy and completeness of physical inventory in assigned area.
COUNTERS
Responsible for recording all information that is required on inventory tag, counting and recording this count on the tag.
CHECKERS
Responsible for recounting of items inventoried to verify the accuracy and completeness of all information recorded on the tag.

General Organization Chart for the Inventory — LeTourneau, Texas Division

groups of men and answering their questions took several days. Since the average worker has little interest in inventory work (performed only once a year) little of the training actually "soaked in." Consequently, there were entirely too many questions to be answered on inventory day.

So, on this inventory we held training sessions with only the supervisors who were in charge of the various inventory areas. Each man was given a manual which included all the procedures necessary to cover his area, a list of his duties, inventory map and an explanation of the inventory organization.

On inventory day, these supervisors took the first fifteen to thirty minutes to instruct their men. Instructions were then fresh in each man's mind, resulting in much smoother performance.

Pre-Inventory Work

Temporary help was hired for a period of about six weeks before inventory day. They worked under the department heads doing clean-up work in areas which needed it and re-stacking where necessary to facilitate counting. Several crews were assigned to the stock rooms where identification was thoroughly checked.

Where possible small items, such as springs, capscrews, nuts, bolts, etc., were pre-counted or weighed, put in paper or burlap bags and sealed with identification tags. A few of each item, sufficient to last until after the inventory, were left loose in each bin, along with the presacked items. The presacking saved many manhours on inventory day and also relieved a great deal of congestion which had previously existed in the stock rooms.

A check list was also given to each department outlining what had to be done to prepare the department for inventory.

Three members of the inventory committee acted as a special inspection committee to inspect all areas of the shop and check on orderliness and other aspects of the pre-inventory work. They reported their findings to each foreman as well as to the Inventory Committee if additional action was necessary.

All work in process was identified as to the last operation to be completed. This was done the day before inventory.

Check lists were provided for the assembly line so that the crews on inventory day merely checked off each assembly operation that had

(*Continued on page* 98)

EDITOR'S BRIEF—R. G. LeTourneau, Inc., Longview, Texas

The Longview, Texas, operation is one of the most complete of several plants operated by the LeTourneau Company, one of the world's largest manufacturers of earthmoving and construction equipment. Other plants are located in Peoria, Ill., Vicksburg, Miss., and Toccoa, Georgia.

R. H. LeTourneau is General Manager of the Longview, Texas, plant; C. Melvin Brooking (author of this article) is Chief Industrial Engineer. Mr. Brooking has described other operational features of the Texas plant in SP&I.

Statistical Quality Control Method—plant tested for the small manufacturer, was discussed by Mr. Brooking on pages 77-80, SP&I for March, 1952.

Electrical Equipment Fundamentals

By A. T. LOHKAMP, Superintendent of Power Plant,
Pasco Packing Co., Dade City, Florida

Part 3—Synchronous Motors

This is the third of a series of 7 "Q & A" articles presented to help plant men become more intimately acquainted with the electrical equipment in their charge. A thorough understanding of the points covered will improve operation and maintenance, and help employees advance to higher positions.

Installments of this Series Include:

Part 1—Operation and Maintenance	*Jan. '53*
Part 2—Distribution and Controls	*Feb. '53*
Part 3—Synchronous Motors	*This Issue*
Part 4—Three Phase Induction Motors	*Apr. '53*
Part 5—Single Phase Motors	*Jun. '53*
Part 6—Technical and Design Data	*Jul. '53*
Part 7—Selecting Generator and Motors	*Aug. '53*

Q—What is an amortisseur winding in a synchronous motor? What is its use?

A—Amortisseur windings usually consist of bars in slots in the pole faces, connected on the ends by continuous or segmented rings. In synchronous motors they serve as starting windings and after the motor has attained running speed they serve as stabilizing windings.

Q—How does a synchronous motor start?

A—It starts as an induction motor until it attains full speed, then it changes to synchronous operation when the amortisseur windings are cut out of the running circuit.

Q—How do polyphase alternating currents produce a revolving magnetic field?

A—Practically all polyphase alternating current motors depend for their operation upon the production of a revolving magnetic field which pulls around with it the rotating part of the machine. This field is set up by the rising and falling currents in the windings. When the current rises in the first phase, a magnetic field is produced by only the first winding. As the current decreases in this phase and increases in the second phase, the magnetic field shifts along a little until it is all produced by the second winding. When the third winding has a maximum current the field is shifted a little more. The windings are so distributed that this shifting is uniform and continuous.

Q—What are the principal types of alternating current motors?

A—The most commonly used alternating current motors may be divided into two general classes: squirrel cages and slip ring or wound rotor motors. There are many modifications of these general types, both electrical and mechanical, which make it possible to secure motors for almost any given application.

Q—What is a synchronous motor?

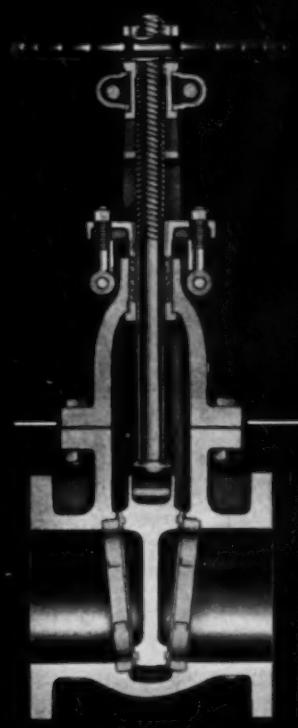
A—A synchronous motor is one which rotates at the same speed as the alternator that supplies its current, or at a fixed multiple of that speed.

The speed is fixed by the frequency of the supply circuit and the number of poles of the motor, and is independent of the load up to the pull-out point. In construction it does not vary greatly from an alternator having stationary armature and revolving field. The field coils are excited by direct current either from a small direct current generator called an exciter, or from some other source.

Q—How does a synchronous motor operate?

A—When a polyphase current is applied to the armature of a synchronous motor, it produces a revolving magnetic field, as previously explained, which revolves in synchronism with the supply circuit. This revolving magnetic field acting on the armortisseur wind-

Some of these Questions and Answers are reproduced by permission from *Electrical Machinery Catechism*. Those interested in learning more about fundamentals of electricity may obtain the *Catechism* from the publishers, Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Ill.



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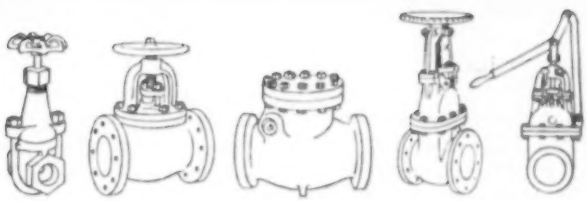

Iron valves in gate, globe, angle, check, and lubricated plug types are manufactured by Walworth. Illustrated is a sectional view of a Walworth No. 726F Standard Iron Body, Bronze Mounted, Wedge Gate Valve with flanged ends. This line of valves is available in sizes 2 to 30 inches. Similar valves of All-Iron type are also available.

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ing produces a starting torque which causes the rotor to rotate. Since the motor starts as a squirrel cage motor, the speed thus reached will be slightly less than a synchronous speed. When excitation is applied to the field it produces alternate north and south poles which lock into position with the revolving field of the armature, and the rotor then revolves in step with the supply circuit.

Q—What are the characteristics of a synchronous motor?

A—Synchronous motors possess several unique characteristics. They operate at a speed which is set by the frequency of the power supply, which means that variations of the load do not cause any corresponding change in speed. The speed depends on the frequency of the supply circuit and the number of poles. A simple rule for finding the speed is to divide the frequency in cycles per minute by the number of pairs of poles, the quotient being the revolutions per minute. (Speed of a synchronous motor may also be found by dividing the number of alterations per minute by the number of poles.)

By varying the field current the power factor of the motor may be varied so that the motor can be operated at unity power factor. With a weaker field strength the power factor is less, and the armature current lags behind the voltage. With a stronger field the power factor is also less, but the armature current drawn from the line will be greater than when operating at unity power factor. With over excited field the motor acts as a condenser with leading current, and can be used to counteract other lagging currents on the circuit, and still carry some mechanical load in addition.

The efficiency of the synchronous motor is much higher than the corresponding induction motor of the same rating. This is especially true with large low speed motors.

Q—What is meant by the "starting torque" of a synchronous motor?

A—The starting torque is the torque or turning effort which the motor develops when full voltage is applied to the armature winding. Before the development of the amortisseur or damper winding, synchronous motors had very little starting torque, but with the modern motor, almost any reasonable torque can be obtained by the proper design of the damper windings. As a general rule the starting inrush of current increases as the starting torques are increased.

Q—What is meant by the "pull-in torque" of a synchronous motor?

A—When the motor has been started as an induction motor, it will run at from 2 to 5 per cent below synchronous speed until the excitation is applied, at which time the rotor pulls into step. The amount of torque or load which the motor will pull into step is called the pull-in torque. Synchronous motors are usually designed for a definite application, so the designer should know the nature of the load which the motor is required to start in order that he may design for the necessary starting and pull-in torques.

Q—What is meant by the "pull-out torque" of a synchronous motor?

A—When a synchronous motor is running in synchronism, the individual field poles of the rotor have a fixed position with respect to the revolving magnetic field of the armature. When a mechanical load or resisting torque is applied to the shaft of the motor, it develops a torque to balance the requirements of the load torque. The increased torque requirement is produced by a backward shift or lag in the position of the field poles with respect to the revolving magnetic field. However, the rotor still maintains its synchronous speed. When, because of the increased torque requirement, the field poles have shifted backward a distance approximately one-half the distance between adjacent poles, the motor is developing its maximum torque. Any further increase will cause the motor to pull out of step, and stop.

The maximum torque which the motor will develop without pulling out of step is called the "pull-out torque."

Q—What are the applications of synchronous motors?

A—There are several classes of service to which synchronous motors are particularly adapted.

(1) Constant speed service.

Because of the higher efficiency possible with synchronous motors, they can be advantageously applied to nearly all loads where constant speeds are desirable.

(2) Reciprocating compressor drives.

Synchronous motors can be built in slow speeds, with high efficiency for direct connection to reciprocating compressors. Loads of this type create large power pulsations. By the proper addition of fly-wheel effect to the motor, the effect of these pulsations can be limited to values which are acceptable to the industry.

(3) Power factor correction.

If the power factor of a plant is low, due to a large inductive load, a synchronous motor can be used to raise the power factor. The over excitation of the field of a synchronous motor causes the current to lead the voltage. This leading current counteracts the lagging current of the inductive load and the total power factor is raised.

(4) Voltage regulation.

On the ends of long transmission lines, the voltage has a tendency to vary greatly, especially if a large inductive load is present. If the inductive load is thrown off, then because of the capacity effect or condenser action of the long transmission line, the voltage may raise above normal. By installing a synchronous motor with a voltage regulator to control its field, voltage change can be compensated for. The action of the voltage regulator is such that when the voltage drops because of inductive load, the field strength of the synchronous motor is increased, which raises the power factor and maintains the voltage at the same value. If the voltage tends to raise as the result of the capacity effect of the line, the regulator weakens the field and causes the motor to have a lagging or inductive load so as to hold the voltage to normal.

(*Continued on page* 100)

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THE above illustration diagrams the advantage you *now* stand to gain with the supercharged, aftercooled* Cooper-Bessemer JS-8.

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One of the hard working "peddlers" offers worthwhile public relations "tips"—

FIRST IMPRESSIONS

By F. J. DONAHUE
Application Engineer

MOST industrial executives place great value on the members of the sales fraternity who call on them. Salesmen not only keep the alert buyer informed of prices, price trends, and availability of the products they are offering, but they often contribute intangible services of inestimable value in the way of suggestions, ideas and technical advice.

It is surprising how many wide-awake managements are fully aware of these benefits they enjoy from their salesmen callers, and indeed, from their own salesmen, yet never seek another form of help the visiting salesmen could give them but quite understandably will not volunteer. This extra help which salesmen cannot be expected to offer is criticism—unfavorable criticism of those aspects of the visited company's establishment which unfavorably impressed the caller.

Wide-awake managements have long known the benefits of good public relations and the creation of good first impressions. This is reflected in modernization of plants and offices, landscaping plant areas and in general presenting a pleasing exterior to the public. These are all worthy projects and are undoubtedly beneficial. But in view of the energy and expense applied to the exterior, it is surprising to find so many companies tolerating other conditions very detrimental to public relations.

Management is seldom aware of the conditions which unfavorably impress the visitor, but you may be sure the visiting salesman is aware of them and if asked could probably offer concrete suggestions for eliminating them.

What are some of these conditions which cause visitors to dislike to call on certain companies?

The Long Wait

One of the most common is having to wait a long time, hours on end sometimes, before getting to see the person desired. Often, this is due to an over-worked buyer or other person receiving callers who cannot handle the calls and his other work without letting one or the other wait. Sometimes, it is because the Information Girl is so busy at her switchboard that she cannot promptly announce callers or has no system and perhaps no authority to call the party again to remind him that the visitor already announced is still waiting. If management is once made aware of this situation it can do many things to cure it.

One manufacturer solved it by making it a rule that when a caller is announced, the party called must receive the visitor in a few minutes or personally advise the caller when he will be able to see him: if not that day, he makes an appointment for another day. This saves valuable time for both individuals concerned. This company expresses its policy regarding callers in two paragraphs printed and framed on the reception room wall to the effect that:

> *We extend to visitors the same courtesy and consideration we should like to have extended to our representatives when they call on your company.*
>
> *If you feel you are being kept waiting an unreasonable time, please ask the Information Girl to contact your party again.*

Lack of Privacy

Inadequate reception room and lack of privacy for interviews can also hurt. The caller who is expected to give his sales talk standing with the buyer in a small hallway surrounded by other callers (perhaps competitors) will not linger, may forego discussion of his product and is unlikely to call again. As a shrewd way to discourage long winded salesmen it is certainly effective. A "Not Welcome" sign over the entrance could be no more effective in discouraging all salesmen worthy the name from calling a second time. Business does not thrive in a social vacuum.

Discourteous Treatment

Irascible, unreasonable, or discourteous treatment of salesmen callers by buyers or receptionists is seldom encountered, but it can be potent advertising of the most negative type. Again, management will rarely discover this unless it is pointed out by those directly exposed to it. The visiting salesman knows it and shuns it as the plague. Ask him.

Parking Problems

Inadequate parking facilities for visitors is a common problem and is not always subject to correction. That something can be done, however, by an alert and considerate management even when space is limited is illustrated by a leading farm equipment manufacturer.

There is a wide street running for blocks along the plant office buildings. Parking signs limit parking to one hour in that area. Salesmen generally park along that street while calling on this plant. Frequently, their calls extended beyond the parking limit and they became accustomed to enter parking fines on their expense accounts as a legitimate cost of doing busi-

(*Continued on page* 102)

traps help uncover hidden steam treasure

The facts are these:

A large southern chemical company about a year ago was up to capacity on their boilers. New process units were being added, requiring more steam—a new boiler seemed inevitable.

About that time they began replacing their old-type traps and bleed-off valves with Yarway Impulse Steam Traps and Strainers. Today, even with the new process units added, their daily steam consumption is nearly 100,000 lbs less than a year ago—the superintendent gives Yarway Impulse Traps credit for the saving.

Yarway Impulse Traps are *designed* to insure sending the most premium B.T.U.'s at top temperature into your product or process . . . *to get equipment hotter sooner and keep it hot!*

Yarway's have 11 other advantages, too—such as *small size, low maintenance, low cost, and availability* from over 200 Industrial Distributors. Write for Bulletin T-1740. Or for steam trap advice, call on your nearby Yarway service engineer.

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the steam trap designed with more production in mind

Vibroflotation Process

Permits Building Plant on Sand at Bonnie, Florida

THE first large plant in the United States to be constructed on sand compacted by Vibroflotation will be completed early in 1953 at Bonnie, Fla., for the International Minerals and Chemical Corp. of Chicago by The Rust Engineering Company, of Pittsburgh and Birmingham.

A savings of ¼ million dollars was achieved by the method which enabled the Bonnie Phosphate Chemicals Plant to be constructed on dry wasteland sands with no support other than the sand itself. The entire plant will cost $12,000,000.

Key to the new practice of building on sand is a sand compaction process called Vibroflotation which The Rust Engineering Company has been franchised to handle by its inventor, Sergey Steuerman, New York City.

Success of this new "foundation" concept may well mark a milestone on the path to greater use of hitherto economically unattractive sand areas such as river basins, shorelines, and deserts for industrial plant building, the companies concerned believe.

International Minerals chose the barren plant site near Mulberry, and about eight miles from Bartow, Fla., because of its proximity to the Bone Valley Gravel from which it recovers phosphate.

Soil Condition

The companies faced a foundation problem at this site since its soil must support not only heavy structures but take shock and vibratory conditions without settlement.

Soil studies showed the site was underlaid with an uncertain base of loose sand, a "sandy matrix stratum," and a third layer of compressible sand and gravelly clay, to a depth of some 60 ft before reaching a suitable bearing strata.

Rust engineers suggested the use of Vibroflotation for sand compaction, since pilings would be substantially more expensive and might give less stable support. The process was begun after thorough tests and reports of soils led engineering authorities to endorse the original recommendation for its use.

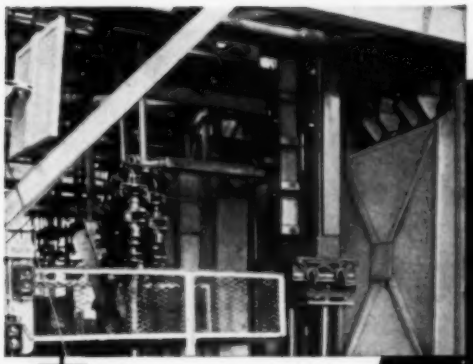
The Vibroflotation process increases the relative density of sandy soil through a shaking and pushing process that packs the sand grains more closely and tightly together and reduces the voids or empty spaces between the particles.

The device used, called a Vibroflot, consists of a tube which is vibrated by an electrically driven eccentric inside it. A 10-ton centrifugal force is produced. This apparatus is attached to a follow-up pipe which houses required water and electric lines.

In operation the Vibroflot is suspended from a crane and guided by vertical wooden leads. Vibrating at

(*Continued on page* 104)

This test pit was dug through an area compacted by Vibroflotation. The dark area is the original soil, and the white is the clean sand added during the compaction process. This picture clearly shows how the original loose sand is compacted in a horizontal direction and replaced by the clean white sand which is also compacted in a horizontal direction as the Vibroflot is extracted from the soil. Horizontal openings in sand wall face are test holes.



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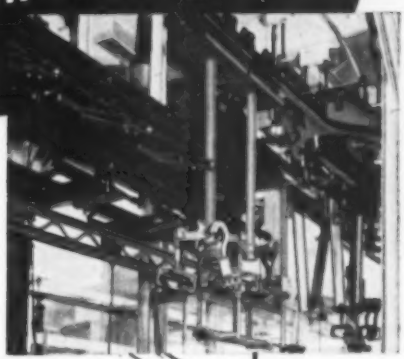

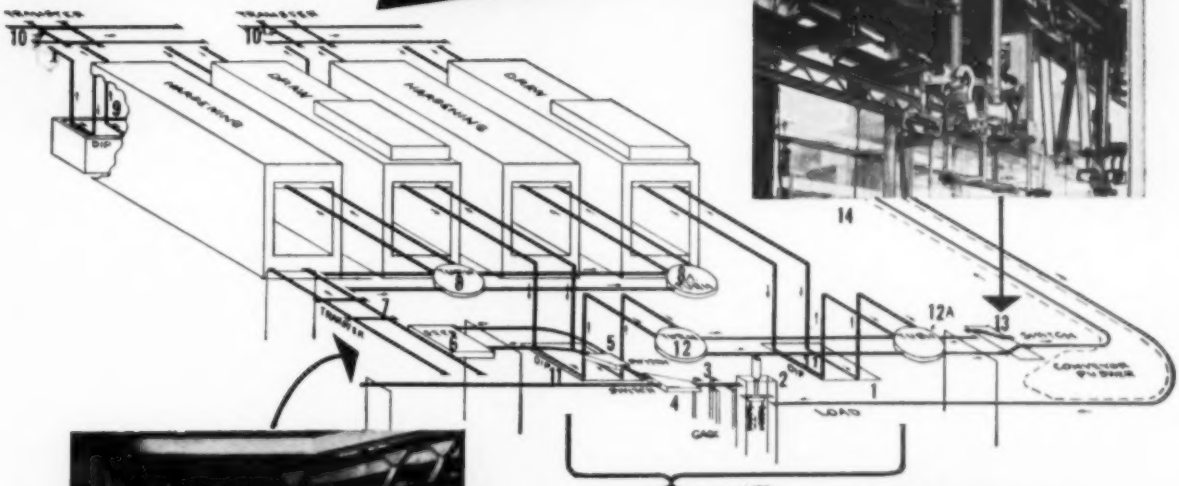

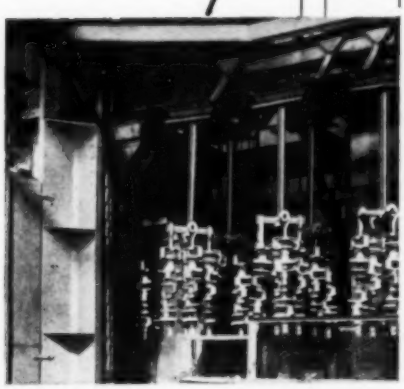

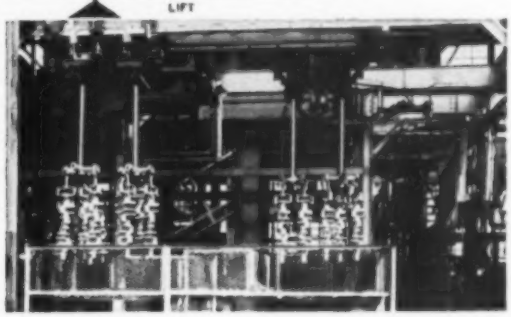

KEY TO DIAGRAM

Station No. 1, Empty Carriers are loaded with crankshafts and raised on Lift No. 2 to working level of furnaces. Carriers pass through gaging device No. 3 to insure concentric loading. Loaded carriers are pushed through Switch No. 4 and Switch No. 5 which are controlled manually from the floor. Carriers are deflected right or left into Feed No. 6. From this point on the system is fully automatic.

Carriers work through Automatic Feed No. 6 onto Transfer Crane No. 7 which travels and lines up with Spur Tracks going to Turntable No. 8. Carriers then move onto the turntable and rotate 90 degrees for feed through the Hardening Furnace.

Upon emerging from this furnace they are dipped into Quench Tank No. 9 and then travel on Transfer Crane No. 10 which carries racks for return travel through the Drawing Furnace. Crankshafts then travel through this furnace and when finished are cooled in Tank No. 11 and fed through Turntable No. 12.

After rotation of 90 degrees the carriers pass through Shuttle Switch No. 13 for single line movement and pick-up by Pusher Conveyor No. 14 for transfer to unloading station.

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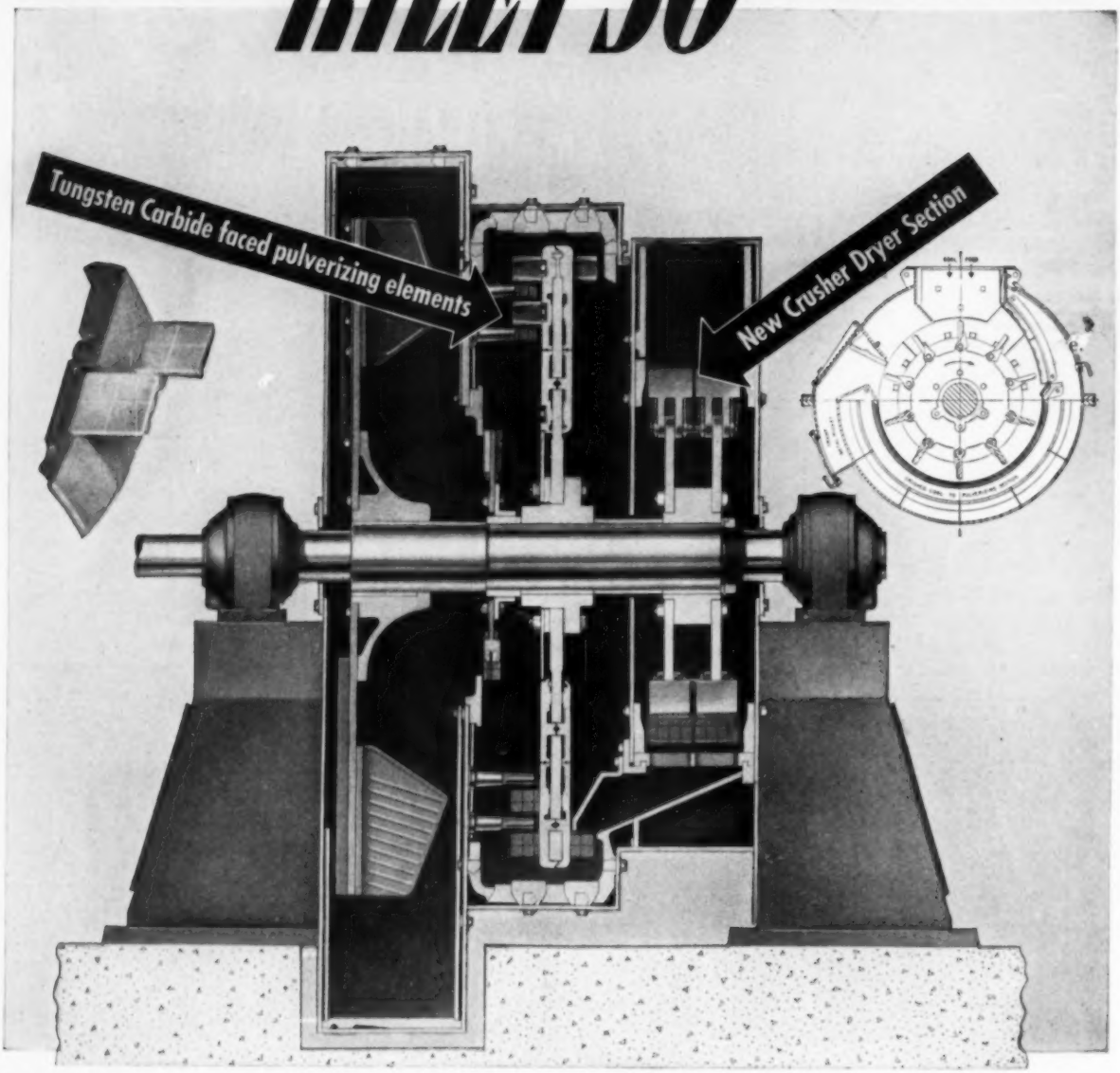
The New "RILEY 50" Pulverizer



Pulverizing elements of the New Riley "50" Pulverizer are faced with tungsten carbide, assuring years of continuous service, low maintenance and sustained fineness without adjustments. The crusher-dryer section evaporates surface moisture so that moisture content of coal does not affect capacity. Foreign materials are also rejected in this section and coal is crushed to fine granular state, without damage to pulverizer.

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3. Pulverizing elements faced with tungsten carbide.
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5. Long periods of operation without necessity of shutdowns.
6. Unusually high capacity per unit of space.
7. Minimum foundation requirements.
8. Ability to carry low loads.
9. Flexibility-wide load range.
10. Operates without coal, with no noise and without wear or damage to parts.
11. Low maintenance and power.
12. No explosion hazard, travel of coal through pulverizer faster than flame propagation.
13. Quiet vibrationless operation.
14. Ease of lighting and regulation.
15. High primary air temperatures.
16. Thoroughly dependable.
17. Negligible cost of lubrication.
18. All moving parts on a single horizontal shaft with bearings outside of housing. No worms or gears.
19. Primary air fan integral with pulverizer—separate fan and motor not required.

All of these people have ordered Riley "50" Pulverizers within the past two years

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Western Colorado Power Co.
South Carolina Public Service Authority
Corn Belt Power Cooperative
Central Ohio Light & Power Co.

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City of Holyoke, Mass.
City of Rochester, Minn.
City of Owensboro, Ky.
City of Austin, Minn.

INDUSTRIAL COMPANIES

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Goodyear Tire & Rubber Co.
Western Electric Co.
General Electric Co.
Hooker Electrochemical Co.
North American Aviation
The Ohio Oil Co.
National Supply Co.
Continental Can Co.
Monsanto Chemical Co.
St. Croix Paper Co.
Celanese Corp. of America
Owens-Corning Fiberglas Co.
Columbia-Southern Chemical Corp.
Lawless Bros. Paper Co.
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A survey of your Power Plant by a consulting engineer will possibly show ways of making surprisingly large savings in your power costs

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WATER-COOLED FURNACES · STEEL-CLAD INSULATED SETTINGS · AIR HEATERS

When your power source fails—

Controls for Emergency Power

Power interruptions are expensive in many industrial operations, but the most important loads can be picked-up quickly by automatically controlled engine-generators.

AUTOMATIC controls are available to insure that the instant the main power source fails or is put out of commission by any mishap, a stand-by engine will be put to work operating a generator for emergency power. With most small engines, the power plant will be on the line producing power in three seconds or less—larger engines in proportion. When the main service is restored, this same control stops the engine and resets itself for the next power demand.

A new addition to such automatic controls, not only tests itself and its auxiliary engine daily to make sure everything is in running order against an emergency, but flashes (or rings) an alarm if the auxiliary engine lacks oil, or water, or is overheated, or anything else is wrong.

Installational Data

Recent Southern industrial installations of automatic controls with a wide variety of engines and generators, indicate that industry is becoming increasingly aware of the benefits of emergency service in case of a power break, either from storms, floods or (perish the thought) war damage.

Pittsburgh Plate Glass Co., for example, has recently installed controls furnished by Synchro-Start Products, Inc., with a Hercules engine at its Clarksburg, W. Va., plant to insure immediate production of emergency power should the prime source fail. This would generate enough current to permit processing of plate glass already in the works, and drive fans to cool sheet glass. The same principle explains the installation of such controls and stand-by equipment at the International Harvester plant at Louisville, Kentucky. There the automatic stand-by equipment will furnish emergency lighting.

The Reynolds Metals Co. at Gregory, Texas, has installed Synchro-Start controls with a Le Roi engine generator set for similar emergencies. A similar set-up has also been installed in the company's new San Patricio County, Texas, plant.

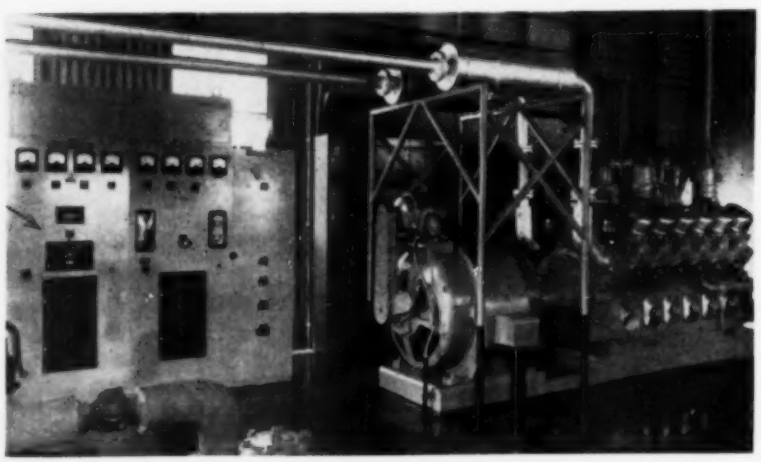
Most new Southern hospitals have learned from industry and have installed such automatically controlled equipment to provide emergency light and power for surgical wards and heating. Even a great many department stores are ready for emergencies in case of power failure. Automatic generator sets supply emergency lighting for floors, exits and fire escapes, and for the public address system. Fire departments have such automatic controls to operate generator sets to produce current for fire alarm signal power, in the event of regular power failure. And some Southern city sewage pumping systems are also users of such equipment.

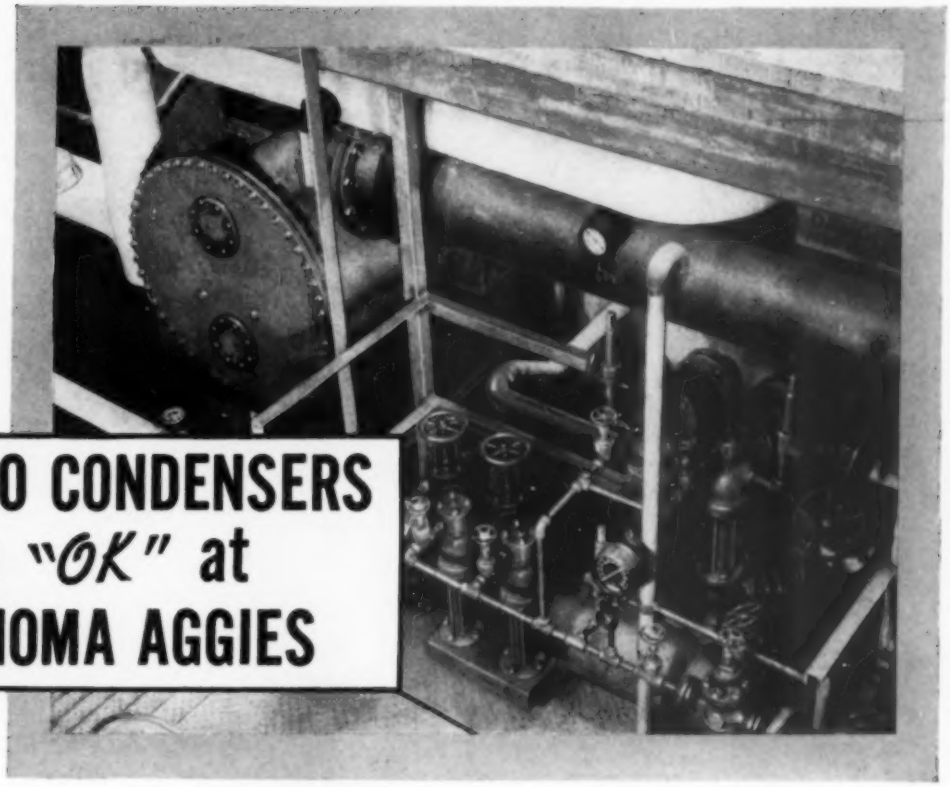
Coal mines, such as the Praco mine (Praco, Ala.) of the Alabama By-Product Corp., use automatic emergency power equipment to operate the mine ventilating system, should there be a power line failure for any reason.

The Texas Eastern Transmission Corp. at Shreveport, La., has in-

The engine generator installation at the Castor, Louisiana, compressor station of Texas Eastern Transmission Corporation is at right. Synchro-Start's latest control (see above) is visible at left panel at arrow.

The functions of this control set are: automatic starting and stopping from any type of pilot switch. Safety protection is provided by automatic shut-down of engine and four directive signals to indicate trouble: low oil pressure, overheating, failure of engine to start, or excessive water jacket temperature.





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Pictured above is one of the three Conseco Condenser and Ejector units installed in the power plant of the Oklahoma Agricultural & Mechanical College, Stillwater, Okla.

Each of these units, consisting of a two-pass, non-divided flow 2000 sq. ft. Conseco Condenser and a two-stage twin element Conseco Steam Jet Air Ejector, serves a 1500 kw. turbine. College engineers stamped them "OK" for dependable, money-saving teamwork.

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Armstrong cast semi-steel compound trap draining coils of large storage type hot water heater.

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3. **There are cast or forged models for any pressure up to 600 lbs.**
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8. **They are guaranteed to give complete satisfaction.**

Your local Armstrong Representative is fully qualified to answer your questions about these traps and their use. Give him a call, or write:

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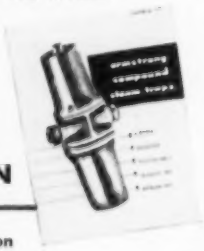


For complete information ask for 8-page bulletin, No. 215 . . . explains and illustrates operation and installation of Armstrong Compound Traps; includes physical data and list prices. Free on request—no obligation.

ARMSTRONG STEAM TRAPS

stalled four emergency generator sets with Synchro-Start controls to furnish power to operate station lights, water circulating pumps, air compressors and operating controls on its oil pipe line, should the prime source of power fail. Ford and Le Roi engines are used in conjunction with stand-by generators. This is very much like the equipment recently installed by the Arabian-American Oil Company in Arabia.

Telephone companies are equally anxious to get fast emergency power. The Southwestern Associated Telephone Co. in Hobbs, New Mexico, reported recently that its stand-by equipment (Buda engine and generator) came in handy when "several power failures occurred due to high winds." The automatic controls, wrote Wire Chief F. G. Roberts, Jr., "took over nicely."

The Mathieson Alabama Chemical Corporation at McIntosh, Alabama—a large company in the chlorine and caustic chemical field—was advised by its engineers that a halt in power would play havoc with some of its chemical processes. Accordingly, the Company has recently installed stand-by Le Roi engine and generator, to be activated automatically by Synchro-Start controls whenever the prime source of power fails. This would insure sufficient emergency power to move chemicals through hazardous intermediate stages.

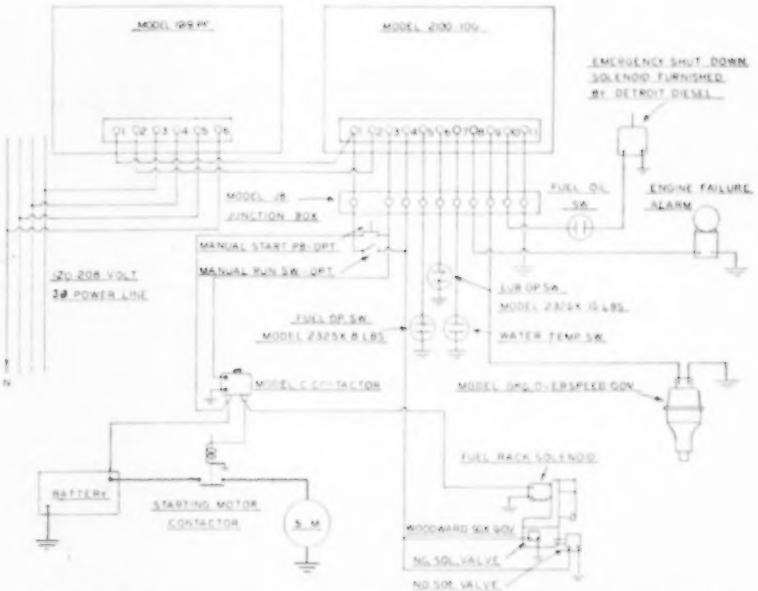


Diagram of Synchro-Start Model 2100 IO G, showing engine control set connected with voltage sensitive relays which acknowlege loss of voltage from normal source. Failure of the power line causes the power failure relay to activate the control which in turn starts the engine. As the engine comes up to speed, the automatic transfer switch (not shown) operates to place the load on the generator. The engine is then stopped automatically on power restoration.

The newest and largest inland towboat, the *Aetna-Ashland* belonging to the Ashland Oil & Refining Co. of Ashland, Ky., has three large diesel engines. Synchro-Start automatic controls activate alarms on these main engines in event oil pressure, water temperature, clutch pressure, etc., is off normal.

Automatic Nailing Technique

(*Starts on page* 53)

Company, had received its pioneer production line tests at the famous Thomasville Chair Company while both Messrs. Williams and Sink were with that North Carolina company.

Pitting the Auto-Nailer against the screw process, along with automatically driven five-penny coated nails, Mr. Riggs reported the Auto-Nailer method not only less costly, but better. In closely controlled factory runs the Auto-Nailer was found to effect a saving of $650 per month over screws in the one operation of attaching slat bearers alone.

Automatically driven regular nails also were less costly than screws, but were discarded due to bending in hardwood, or else causing splitting. Despite pre-boring, screws also caused occasional splitting.

The Auto-Nailer caused no splitting, its nails wouldn't bend, far better jointing resulted from the tremendous squeeze pressure it exerted—and it was decidedly the least costly of the three methods. The auto-nailed glue joint showed a breaking load of 1690 lb, against 1398 for screws and 1143 for regular nails.

Of additional importance, tests showed that bearers pulled loose from the rails in both the screw and regular nail methods, while the auto nailed bearers held until the rail itself split.

Mr. Riggs also reported that the tests demonstrated less investment in machinery was required to attach the bearers by the Auto-Nailer method.

Among jobs now being performed on all types of Mengel furniture with the Auto-Nailer are attaching gallery rails, stiffner rails, kicker strips, cleats, skid blocks, cap rails, various types of moldings on doors, drawers and fronts, apron blocks and numerous others. It also is used for starting nails to be driven later by hand.

In some instances sub-assembly pieces have been respecified for auto nailing since in the words of Mr. Sink, "where we use the Auto-Nailer, output is doubled, tripled or quadrupled, wastage is practically eliminated, a better glue joint is effected, and labor costs are cut as much as 90 per cent."

HELPING the *MAN-IN-THE-PLANT*

ideas . . . tools . . . methods . . . devices

Hydraulic Conversion Factors

New table gives friction, velocity and friction head data for flow of liquids in other than standard steel pipe.

AT THE present time, there are many nomographs and tables available for obtaining the friction, velocity, and friction head for fluids in standard (Schedule 40) steel and cast iron pipes. But little if any data is readily available for plastic lined, plastic, and light wall steel pipes. Therefore many plant engineers are losing time looking in handbooks for the needed conversion factors.

This table, prepared by Stanley Lenox of The Permutit Company, is an attempt to make friction, velocity and friction head data available for engineers, designers and others who must deal with the flow of liquids or fluids in other than standard steel pipes.

The tables are based on the following widely accepted relationships:

1. Velocity is inversely proportional to the area or pipe diameter squared.
2. Velocity head is proportional to the velocity squared or inversely proportional to the pipe diameter to the fourth power.
3. Friction loss is inversely proportional to the roughness coefficient "C" to the 1.85 power and the pipe diameter to the 4.87 power (Williams & Hazen formula). "C" is usually taken as 100 in designing steel and cast iron pipes, and most tables are based on this value.

The inside diameters listed in the table are those currently used by manufacturers such as Amer-

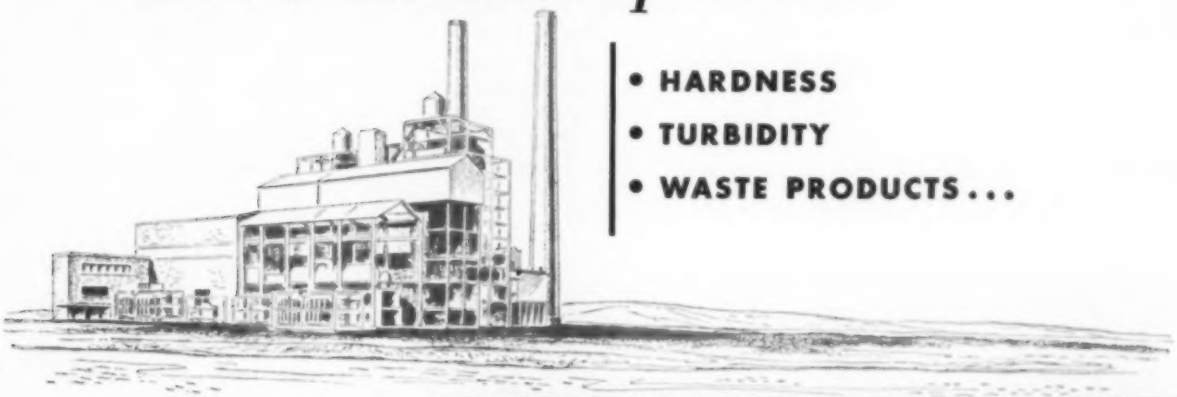
HYDRAULIC CONVERSION FACTORS FOR VARIOUS TYPES OF PIPES

To obtain velocity, velocity head, or friction loss for pipes listed below, take value for Schedule 40 pipe (C = 100) and multiply by factor in table.

Type of Pipe	Hydraulic Property	Nominal Pipe Size — Inches										
		½	¾	1	1¼	1½	2	2½	3	4	5	6
Schedule 10 Steel C = 100	Vel.	.853	.872	.916	.916	.919	.922	.881	.883	.892	.906	.910
	Vel. Head	.728	.754	.836	.840	.841	.842	.773	.783	.799	.826	.828
	Friction	.677	.711	.804	.808	.810	.813	.731	.746	.760	.790	.795
	Pipe I. D.	.674	.884	1.097	1.442	1.682	2.157	2.635	3.260	4.260	5.295	6.357
Rubber Lined Sch. 40 Steel C = 140	Vel.			1.72	1.49	1.41	1.30	1.24	1.19	1.14	1.17	1.14
	Vel. Head			2.97	2.23	1.97	1.67	1.54	1.40	1.29	1.36	1.29
	Friction			2.02	1.42	1.22	1.01	.907	.814	.734	.782	.733
	Pipe I. D.			.799	1.130	1.360	1.817	2.219	2.818	3.776	4.672	5.690
Saran Lined Sch. 40 Steel C = 140	Vel.			2.33	1.68	1.44	1.50	1.31	1.24	1.23		1.23
	Vel. Head			5.43	2.85	2.06	2.25	1.72	1.55	1.52		1.51
	Friction			4.21	1.91	1.29	1.44	1.04	.916	.894		.889
	Pipe I. D.			.687	1.0625	1.344	1.687	2.156	2.750	3.625		5.469
Uscolite (U. S. Rubber Co.) C = 140	Vel.	1.29	1.23	1.20	1.17	1.15	1.13					
	Vel. Head	1.69	1.52	1.44	1.36	1.33	1.29					
	Friction	1.01	.895	.842	.779	.759	.733					
	Pipe I. D.	.55	.742	.96	1.278	1.50	1.94					
Saran & Parian (Amer. Hard Rubber Co.) C = 140	Vel.	1.29	1.23	1.20	1.17	1.15	1.13	1.18	1.16	1.15		
	Vel. Head	1.69	1.52	1.44	1.36	1.33	1.29	1.38	1.36	1.33		
	Friction	1.01	.895	.842	.779	.759	.733	.800	.781	.758		
	Pipe I. D.	.546	.742	.957	1.278	1.500	1.939	2.277	2.842	3.749		
Hard Rubber (Amer. Hard Rubber Co.) C = 140	Vel.	1.54	1.44	1.25	1.22	1.26	1.22	1.20	1.24	1.15	1.12	1.16
	Vel. Head	2.40	2.07	1.57	1.49	1.58	1.47	1.45	1.55	1.33	1.27	1.35
	Friction	1.55	1.30	.932	.870	.933	.863	.847	.916	.758	.721	.776
	Pipe I. D.	.500	.687	.937	1.250	1.437	1.875	2.250	2.750	3.750	4.750	5.625

Note: Linings are $\frac{1}{8}$" thick for sizes 4" and under; $\frac{3}{16}$" for 5" and 6" sizes.

Raw Water Supply with all these impurities:

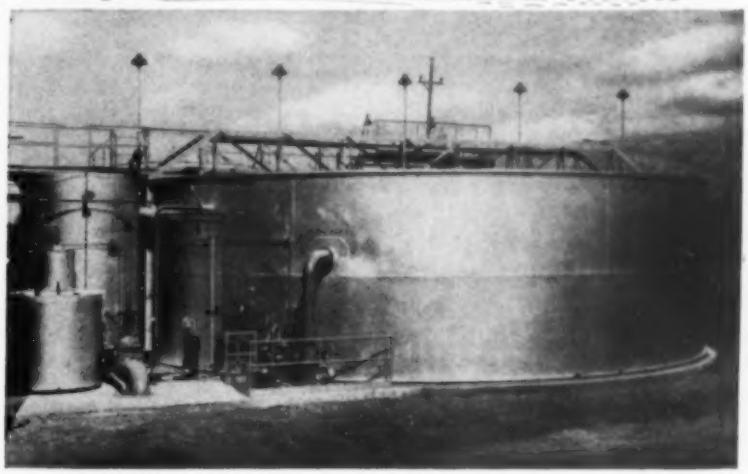


- **HARDNESS**
- **TURBIDITY**
- **WASTE PRODUCTS...**

softened and clarified by a

GRAVER Reactivator

at Utah Power & Light Co.



This raw water supply is poor... very poor...

- ***The total hardness ranges from 350 ppm to 700 ppm.***
- ***The turbidity may reach 1200 ppm.***
- ***It may contain sugar beet pulp and various other vegetable and animal wastes.***
- ***The organic pollution is so high that chlorine pretreatment is required.***

The raw water is used for the cooling tower make-up. The Graver engineers were consulted, and a 3000 gpm Graver Reactivator designed to reduce total hardness to 250 ppm and turbidity to less than 10 ppm was installed.

All over the country, central power generating stations, industrial plants and municipalities are being served by Graver water conditioning equipment to meet individual softening and clarifying requirements.

Write for bulletin describing Graver units in detail, and be sure to consult Graver before purchasing any water conditioning equipment.

Graver Reactivator at Gadsby Plant of Utah Power & Light Co. Also in this plant the make-up for a boiler with a capacity of 620,000 pounds of steam per hour goes through Graver Filters and Automatic Zeolite Softeners which reduce the hardness to zero before passing to evaporators.

GRAVER WATER CONDITIONING CO.

Division of Graver Tank & Mfg. Co., Inc.

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IN CANADA: The Bird-Archer Co., Ltd.; Cobourg, Ontario

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GRAVER

GW 400

ican Hard Rubber Company and the United States Rubber Co. The roughness coefficients are those usually assumed for the particular material in question. Blank spaces indicate that a complete line of pipe and fittings is not currently being manufactured for that size.

Although the materials listed are those in widest use at the present time, the factors shown apply to any pipe having the same inside diameter and roughness coefficient.

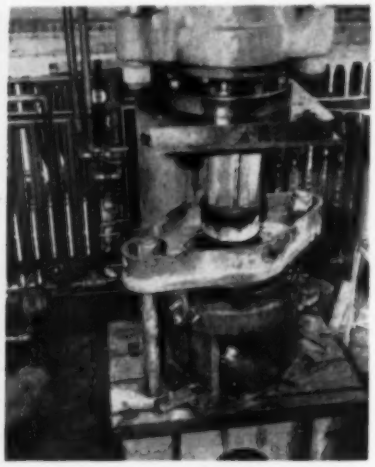
The following solution of a typical problem shows how the accompanying table is used:

Problem: Determine the friction loss through 350 ft of 1½ in. Saran lined steel pipe carrying 30 gallons of water per minute.

Solution: From "Cameron Hydraulic Data" or the "Permutit Data Book," or other table, note the friction loss per 100 ft of 1½ in. Schedule 40 pipe, C-100, is 11.1 ft. From the accompanying Table of Hydraulic Conversion Factors, the friction correction factor is 1.29. Therefore, the friction loss equals:

$$\frac{350}{100} \times 11.1 \times 1.29$$

The answer is 50.2 ft of water.



Dies of composite fabrication cost less to make and are easier to maintain.

$$$ For Your Ideas

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

Southern Power & Industry
806 Peachtree St., N.E.
Atlanta 5, Georgia

Tooling Cost Reduced

COMPOSITE fabrication of tools and dies using a base metal of mild steel with a welded overlay of tool steel on working surfaces can reduce the cost of tooling by as much as 75 per cent. One company used this tool building technique to fabricate dies for forming heads out of 3/16 in. plate. To fabricate the dies completely out of tool steel would have cost four times as much as it did to make them using composite fabrication. In addition, servicing the dies is considerably easier.

The female element of a die for forming 10 in. heads is shown. The ring, mounted on a base plate, is cut from C1040 mild steel. After a preheat of 400 F, an overlay of tool steel quality weld metal is deposited on the inside diameter of the ring, and back on the flat top surface for approximately two inches.

The deposit is made in two passes using a 5/32 in. diameter "Toolweld A&O" electrode, manufactured by The Lincoln Electric Company. This leaves a deposit of 1/16 in. of weld metal after grinding.

Weld metal deposited by this electrode is tool and die steel of the 5 per cent chrome type. It can be used in the "as-welded condition," or can be hardened by air cooling or oil quenching. The hardness as deposited is 58 to 65 Rockwell C.

For this particular application where service is metal to metal wear in forming, it was felt that the "as-welded" deposit was adequate for the job.

The male half of the die is also made by composite fabrication. This half, shown mounted on the ram of the press, is made of the same mild steel with the wearing surfaces overlayed with weld metal.

The three dies made for this press for forming 8, 10 and 14 in. heads form between 3000 and 4000 pieces before needing repair. To put them back in service additional weld metal is put on the wearing surfaces and ground to size.

Fuels for Boiling Out New Boilers

THE CHOICE of fuel to be used in boiling out new boilers will be influenced by the type of boiler, the type of permanent fuel burning equipment, the availability of steam or compressed air, the capability of the attendants and the relative cost of fuels.

The most desirable fuel for use in large water cooled furnaces is **diesel fuel oil** atomized by compressed air. This fuel can be stored safely; it does not require preheating; it is easily pumped and the flame shape can be controlled by varying the pressures of the oil and compressed air. Burning this oil in

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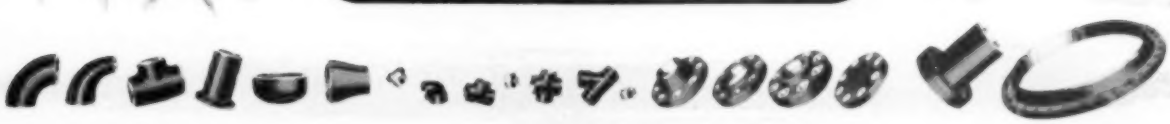

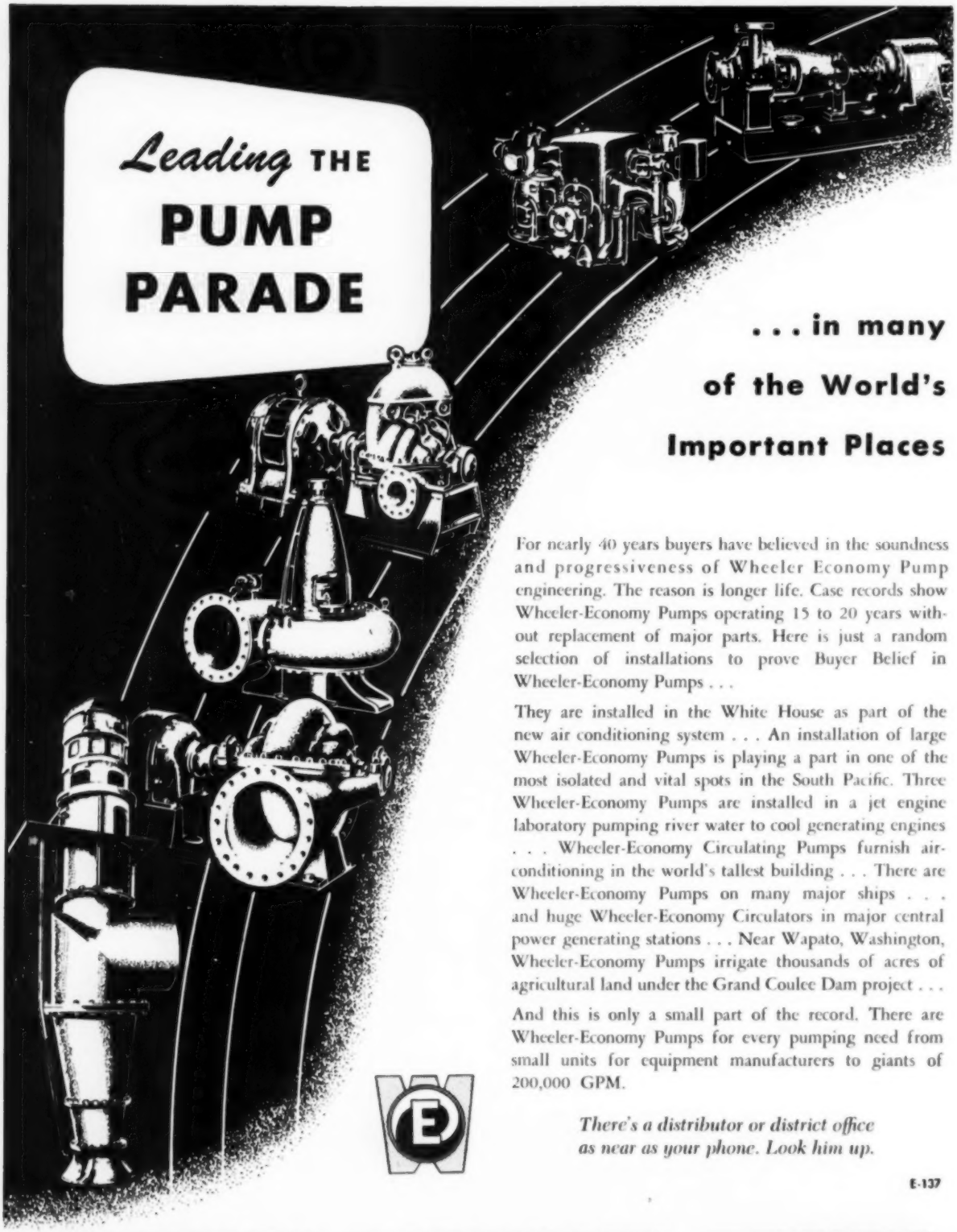

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. . . in many of the World's Important Places

For nearly 40 years buyers have believed in the soundness and progressiveness of Wheeler Economy Pump engineering. The reason is longer life. Case records show Wheeler-Economy Pumps operating 15 to 20 years without replacement of major parts. Here is just a random selection of installations to prove Buyer Belief in Wheeler-Economy Pumps . . .

They are installed in the White House as part of the new air conditioning system . . . An installation of large Wheeler-Economy Pumps is playing a part in one of the most isolated and vital spots in the South Pacific. Three Wheeler-Economy Pumps are installed in a jet engine laboratory pumping river water to cool generating engines . . . Wheeler-Economy Circulating Pumps furnish air-conditioning in the world's tallest building . . . There are Wheeler-Economy Pumps on many major ships . . . and huge Wheeler-Economy Circulators in major central power generating stations . . . Near Wapato, Washington, Wheeler-Economy Pumps irrigate thousands of acres of agricultural land under the Grand Coulee Dam project . . .

And this is only a small part of the record. There are Wheeler-Economy Pumps for every pumping need from small units for equipment manufacturers to giants of 200,000 GPM.

There's a distributor or district office as near as your phone. Look him up.

E-137

WHEELER-ECONOMY PUMPS

ECONOMY PUMPS, INC. · DIVISION OF C. H. WHEELER MANUFACTURING CO.
19TH AND LEHIGH, PHILADELPHIA 32, PA.

mechanical atomizing burners should **never** be attempted in a large water cooled furnace because of the very real hazard of incomplete combustion. The unburned vapors condense on the relatively cold air preheater surfaces where they constitute a fire hazard when the unit is first operated to carry load. This fuel when atomized by air is a relatively safe fuel and is usually obtainable in the required quantity and at a reasonable price.

Second choice would be **natural gas** burned in small capacity home made burners or flares. Great attention to the combustion air supply is necessary to prevent loss of ignition with excess air or to prevent excessive flame length with a deficiency of air. "Panting" of the furnace also indicates insufficient air. This fuel is not considered to be as safe for this purpose as the diesel oil.

Heavy fuel oil may be successfully atomized with steam but until the furnace warms up there is usually trouble from smoke. Incomplete combustion is experienced with some burners, and when this occurs the air preheater surfaces are likely to be fouled in a short time by a greasy soot. A fire hazard can exist in aggravated cases but it is not nearly as great as with mechanically atomized diesel oil.

Wood fires were commonly used in the past especially in refractory furnaces. Such a fire was ideally suited for the slow drying of the moist mortar and brickwork. Such a fuel may still be used in boiling out a boiler equipped with a mechanical stoker. It is important to see that the wood is free from nails which might catch in the stoker mechanism and cause it to jam. Some trouble has been reported from sticky resinous deposits in air preheaters following the use of wood fuel. Of course the labor cost involved in firing this fuel is somewhat more than for oil or gas fuels.

Pulverized coal would be the last choice of fuel for boiling out purposes. It follows that it would be used in combination with oil or gas ignition torches. The minimum burning rate for stable ignition will ordinarily be so high that intermittent firing must be resorted to. The furnace explosion hazard is ever present, and for that reason high grade, alert attendance must be provided.

Storage Battery Charging Technique

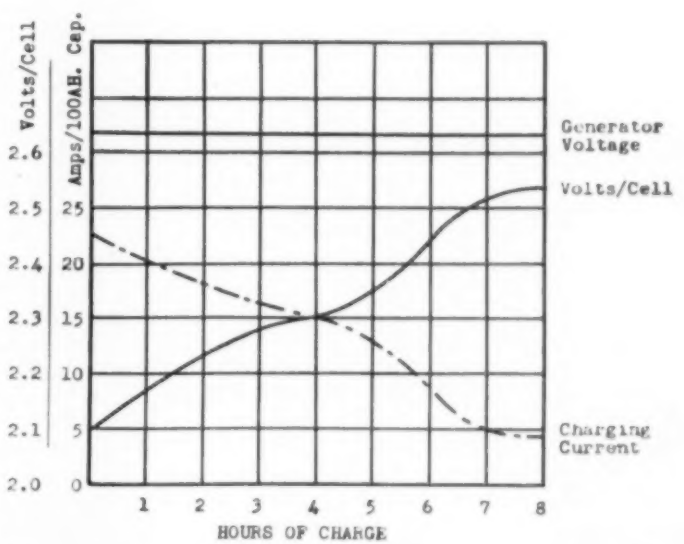
THE PRIMARY cause of premature storage battery failure is improper charging. It is estimated that industry is currently losing from one-third to one-half its battery capacity due to this factor. And yet battery charging is simple. In fact, it is almost entirely automatic.

One of the most widely used methods of charging industrial-truck and mine-haulage batteries is the Modified Constant Voltage method. This method generally employs a constant voltage d-c generator, although a shunt wound generator can be used when single batteries are to be charged. When the constant voltage generator is used, a ballast register is connected in series with the battery.

At the beginning of the charge, batteries are charged at a high starting rate, the rate depending upon how much the batteries have been discharged. As the battery becomes charged, the charge rate automatically tapers off as the battery voltage rises and approaches that of the generator. Approximately the last 20 per cent of charge is given at a low finish rate—5 amp per 100 amp hours capacity of the battery. Manufacturers publish recommended finish rates of their batteries and it is important that these rates not be exceeded. If they are, batteries will overheat and hydrogen will be given off from the electrolyte. When the battery is fully charged, automatic controls disconnect it from the charging circuit.

Generator Voltage

From the characteristics of the lead-acid battery and by experience, it has been determined that the bus voltage for an eight hour charge should be 2.63 volts per cell. For example, a 15 cell battery requires a 39.5 generator bus voltage. This voltage is a little greater than that theoretically required but is used because it furnishes a stable charging current. If a lower voltage were used, the charging current would be subject to considerable variation with slight changes in charging voltage as the voltage of the battery



This graph indicates generator voltage charging current and volts per cell when charging by the modified constant voltage method.

nears that of the generator.

Ampere Capacity

The ampere capacity of the charging generator is determined by the ampere-hour capacity of the battery and the number of batteries to be charged. For each 100 ampere-hours of battery capacity, the generator should be able to deliver 22.5 amperes. Thus, charging equipment to charge a 500 ampere hour battery should deliver 112.5 amperes.

Control of Charge

One method of controlling the charge employs the Ampere-Hour meter which measures the product of current and time without regard to voltage. In many installations the meter is mounted on the panel board of the charging equipment, each battery having a separate charging panel. It is set to terminate the charge when the ampere-hours required to bring the battery to full charge have been delivered. To determine the ampere hours required, the specific gravity of a pilot cell is taken before putting the battery on charge, and a chart, supplied by the battery manufacturer, is consulted to give the correct meter setting for that type battery at that specific gravity. Once the meter is set, it is not necessary to reset or take any readings except the final specific gravity reading. Another type of Ampere-Hour meter is mounted on the body of the battery powered equipment. It registers as the battery discharges and does not have to be set for charging.

A second method of regulating or controlling the charge is by means of a Voltage Relay Timer. When this method is used a relay operates a timer when the battery reaches that state of charge at which the battery starts to gas—2.37 volts per cell at 77 F. The battery is approximately 80 to 85 per cent charged at this point. The timer, which has been preset, automatically terminates the charge at the end of the time period. The timer setting is generally 2.5 to 3 hours although it will be greater for older batteries. When specific gravity readings taken at the end of the charge indicate the battery is not fully charged, the timer setting should be increased ½ hour.

Of primary importance to correct charging is the keeping of records. Each battery should be numbered, and when brought in for charging the date, time, vehicle number, battery number, specific gravity of a pilot cell and temperature of a pilot cell should be recorded. This same information should be recorded when the battery is taken off charge.

Thus, a complete record of the battery characteristics is furnished which will indicate whether the battery is being correctly charged. For example, if the specific gravity is less than 1.260-1.280 at the termination of the charge, the battery has been undercharged. If the temperature is above 110 F the charging rate has been too high. If the records indicate that the battery is being over or undercharged, the reason can be determined and corrected before work stoppages occur due to battery failure.

When records indicate over or undercharging, the battery should be checked to see that all cells are functioning; charging equipment should be checked to see that it is correctly adjusted; and instruments should be checked to see that they indicate correctly.—*K. A. Vaughan, Gould Storage Battery Corporation.*

High-Speed Level Checker

Cadmium sulfide crystals and x-ray tubes provide newest control for measuring, and filling containers

A TINY crystal of cadmium sulfide, about the size of a matchhead, acting on signals from an 80,000-volt x-ray tube, is now doing a "watchdog" job for several major brewers, insuring automatically that all cans of beer are tightly sealed and contain exact measure.

Known as a high-speed level checker, the unit is capable of inspecting cans or cartons at rates far greater than those at which any processing line presently operates, and can work at and above a speed of 900 containers per minute within an accuracy of 30 drops of beer, or plus-or-minus 1/64".

In addition to beer, the unit can be adapted to inspecting many products packed in cans or cartons, including such liquids as milk, fruit juices, waxes, oils, and chemicals; such grains as salt, cereals and soaps; and powders, such as flour, bake mixes, insecticides and tooth powders.

The cadmium sulfide crystal is grown in vapor-filled hothouses at GE's X-Ray plant in Milwaukee, where the widespread applications of the new detectors were first predicted a year ago. The department previously announced a special adaptation of the crystal principle to the automatic inspection of hand grenade fuses, insuring the full content of time-delay powder in the fuse after they are assembled at Army Ordnance plants. These are enhancing safety and saving millions of dollars in inspection costs, as compared with earlier, more expensive methods using non-automatic x-ray and x-ray films.

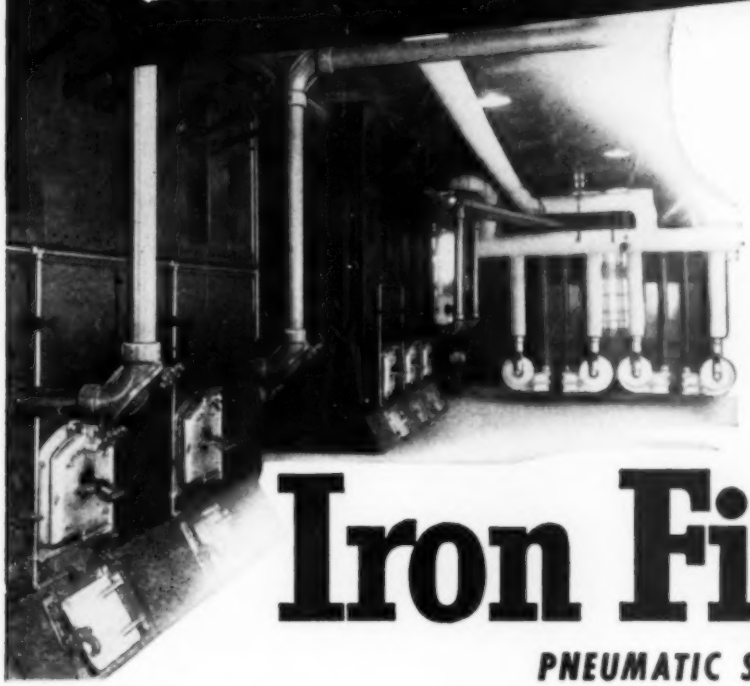
The brewers using the new unit term it a "sleepless eye," which performs a needed job that has been impossible hitherto. It unfailingly spots low-fill, indicating leaky cans, and can also be adapted to checking overfill, which leads to excessive gas pressure.

Operation

The crystal detector is placed at the desired height of fill level on one side of the conveyor line, with the x-ray tube on the other. When a can or carton that is not full enough comes along, the crystal receives an extra jolt of x-ray from the tube, which changes it from a non-conductor to a very good conductor of electricity and starts an electrical circuit in operation. This is relayed to an automatic air-blast unit, which blows the faulty container off the line.

This apparatus is the "last word" on the inspection line, being placed at the conveyor just before the cans are loaded into cartons.

Burns either Coal or Wood Waste



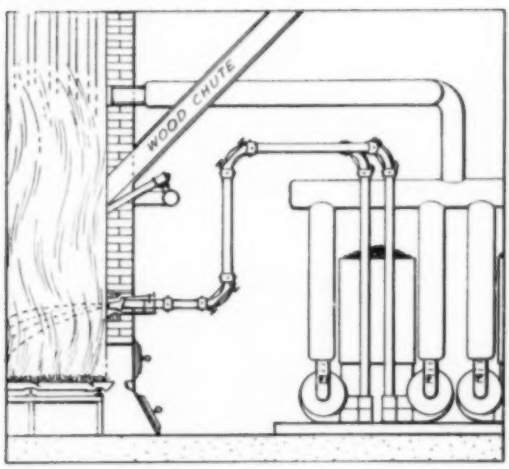
Iron Fireman coal stokers enable Bassett Furniture Industries to utilize wood refuse as fuel

These Iron Fireman Pneumatic Spreader stokers pick up the load automatically the moment the supply of wood refuse runs out. They enable the company to use wood waste as a primary fuel. Only enough stoker coal is burned to maintain a uniform steam supply.

Iron Fireman automatic air control and exclusive air-cooled grates give top firing efficiency with both fuels. Stokers are installed in six boilers, each with a capacity of 40,000 lbs. of steam per hour, which carry the power load for the various Bassett factories.

Iron Fireman

PNEUMATIC SPREADER COAL STOKERS



Coal is thoroughly dried and preheated before it is conveyed pneumatically to furnace grates. The distributor nozzle spreads the dry coal over the *entire* grate in a shallow, uniform fuel bed. Preheated fines burn in suspension, reducing cinder carryover and greatly improving combustion efficiency and responsiveness as compared with stokers which do not preheat coal. Wood waste is fed through chute at upper right.

You save three ways when you install an Iron Fireman Pneumatic Spreader stoker. You save on installation costs, you save on labor costs, and you save on fuel costs. This outstanding coal firing system dries, preheats, conveys and fires the coal. Manual coal handling is completely eliminated. Coal is piped directly from bunker to fire, doing away with the costly coal handling equipment usually required.

The Iron Fireman Pneumatic Spreader stoker burns a wide range of coals, including low ash fusion, sub-bituminous and lignite—ranging from one fourth inch slack to two inch top size. Readily adaptable to any boiler room layout. Capacities available to 1,000 boiler horsepower in single units; multiple units for larger capacities.

Dual and Triple Fuel Firing

While Iron Fireman stokers are often used in conjunction with the firing of wood waste, they are also readily combined with Iron Fireman oil and gas burners. The ability to shift fuels quickly will protect your plant against fuel shortages and permit advantageous buying of fuel. Send for descriptive literature.

Coal, Gas, Oil firing equipment for heating, processing, power

THE IRON FIREMAN

IRON FIREMAN MANUFACTURING COMPANY
3047 West 106th Street, Cleveland 11, Ohio.
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Address_____

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Free additional information is available to readers of SP&I. Circle the item code number on one of the reader service post cards provided on pages 17-18.

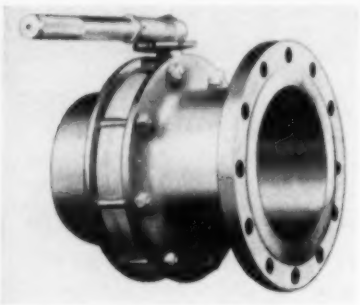
gineered to operate against minimum resistance pressures.

It is of direct-drive design and provides air deliveries from 5,500 to 38,000 cfm. Sizes range from 24 to 48 in. blade diameters. The square mounting panel, with flange holes, simplifies installation.

Fan has a streamlined orifice for more efficient air entrance and airfoil blades with "Gull Wing Design" for uniform pressure-velocity. Aluminum alloy blades are non-overloading and may be replaced individually if broken by accident.

Butterfly Valve

D-8 KEYSTONE TOOL CORP., 5325 Kirby Drive, Houston, Texas, has marketed a butterfly valve which permits use of any combination of interchangeable end connections.



Keystone Tool Corporation's new butterfly valve design.

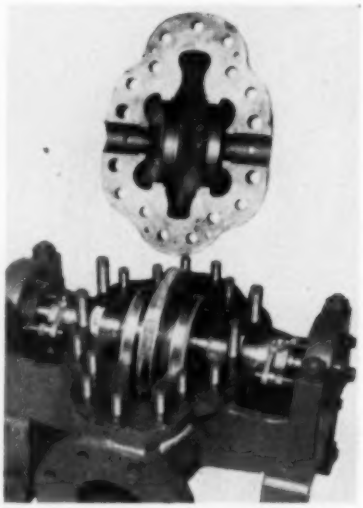
Manufacturer recommends the valve for use on liquid, sludge or dry material lines. Disk of the valve seals in a resilient, oil and acid resistant seat and provides complete shut-off against pressures up to 150 psi or against vacuum.

Entire sealing section (seat, disk and handle) can be removed for inspection, cleaning or replacement without disconnecting the line.

Valves are manufactured in sizes from 2 through 12 in.; any combination of threaded, flanged or welding end connections can be furnished; valve bodies and disks can be supplied of steel, bronze, aluminum or other alloys.

Centrifugal Pump Line

D-9 GOULDS PUMPS, INC., Seneca Falls, N. Y., has announced a new series of single stage, double suction centrifugal pumps, designated as the Fig. 3405 pumps, with several advances over previous designs.



Here's a Goulds Fig. 3405 centrifugal pump, size 4" x 6"-8, with top section of the casing removed, showing the 8 in. impeller, wearing rings, and bearings. This model has a capacity of 550 gpm at a head of 61 ft.

Standard features on all the Fig. 3405 pumps include renewable stuffing box bushings, sealed bearing housings, cowl-type glands suitable for use with quenching liquids, stainless steel impeller keys, Teflon water seal rings, die-formed stuffing box packing, and corrosion-resistant gland bolts.

Compactness is an outstanding feature of the new pumps. Bearing spans have been kept to the shortest practical distance, resulting in overall savings in length of as much as 50 per cent in some models.

The pump casings are horizontally split, and removal of the upper half permits inspection, maintenance, and removal of the entire rotating element without disturbing the suction and discharge piping, or pump and driver alignment.

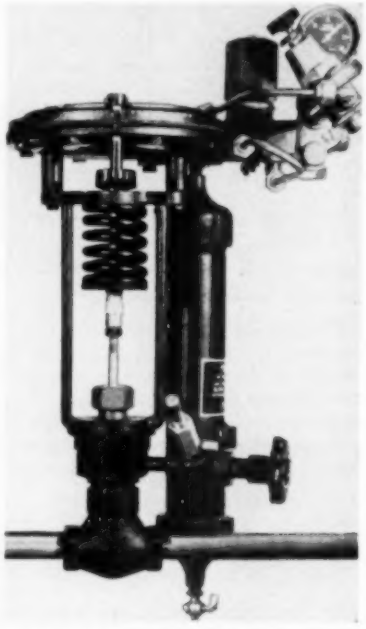
In the Fig. 3405 line there are three different assemblies of shafts and rotating parts. However the wide interchangeability of parts in each assembly makes it possible to provide 19 different pump sizes in the three groups. In addition, a unique locking design of shaft sleeves makes it possible to change the direction of impeller rotation easily in the field without additional parts. Thus, 38 different pump combinations are offered in the new series. Capacities range from 200 gpm to 6,400 gpm with heads up to 260 ft.

Automatic Intermittent Blowdown Control System

D-10 RICE INDUSTRIES, 24 Clearview Drive, Pittsburgh 5, Pa., has announced the new Rice Intermittent Blowdown Control Valve, which permits completely automatic control of boiler blowdown operations.

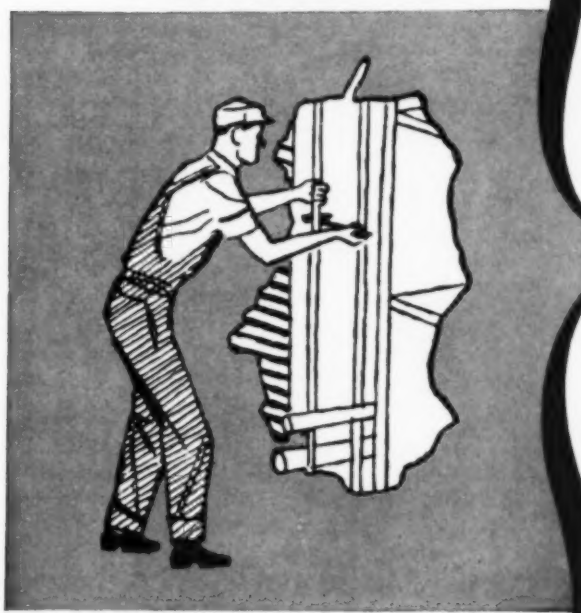
By automatically and accurately taking over the job of regular boiler blowdown, the new Rice Valve effects substantial savings in operating efficiency, labor, and maintenance downtime, according to the manufacturers.

The valve causes repeated disturbance of boiler water, preventing water crystal growth and formation of the scale and residue that normally build up insulation against the primary fuel. The new control valve is



The Rice Intermittent Blowdown Valve — automatic cycle-timer is not shown.

Pipe Repair Jobs . . .



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add up to just one thing . . .

CORROSION COSTS YOU MORE THAN WROUGHT IRON

There's nothing like a repair job to point up the false economy of installing low-first-cost piping. The original installation is quickly made by a pipe fitter, but the replacement calls for hours of work by as many as five crafts, all carrying a high price tag. This first failure may wipe out initial savings, a dozen times over. And loss in production or utilization during shutdown may amount to far more than the maintenance charge.

It all adds up to one thing—*corrosion costs you more than wrought iron.*

In literally thousands of applications where corrosion is a threat to service life, the use of Byers Wrought Iron pipe is the soundest kind of economy move. This material's greater durability, proved in past service records, is curbing high maintenance and repair costs in a wide variety of industries.

The next time you approve or specify pipe, investigate the superior performance of Byers Wrought Iron pipe. Remember, it takes only ONE to *install* pipe, but FIVE to *repair* it!

You'll find a lot of helpful information on the control of excessive maintenance in our bulletin, WROUGHT IRON FOR PIPING SYSTEMS. Write for your copy.

Labor costs shown above are estimated national averages according to Bureau of National Affairs, Inc.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N.Y.

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CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

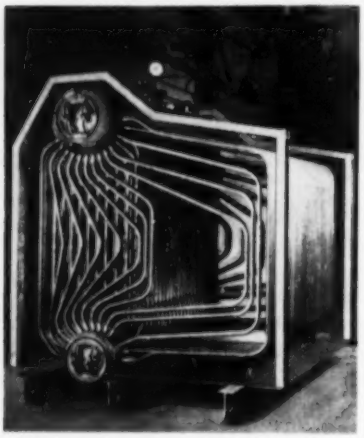
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

particularly valuable where feed water supply is badly contaminated.

Permanently attached to the blowdown outlet of the boiler, and equipped with an automatic cycle-timer, the valve assumes complete blowdown control. It can be adapted to all types of industrial boilers and, once correctly set, requires practically no attention.

New Package Type Water Tube Boiler

D-11 SPRINGFIELD BOILER CO., 1957 E. Capitol Ave., Springfield, Ill., has announced a new standard line of package type water tube boilers designed especially to meet many present day requirements for steam and high temperature hot water in industrial and power projects.



All boilers in the new Springfield line are of a 2-drum, bent tube design featuring a water cooled furnace in which tangent water tubes completely shield the full length combustion chamber. Provision for superheat up to 200 F is available as auxiliary equipment.

The boilers are offered in sizes ranging from 7,500 to 30,000 lb of steam per hour (or equivalent water ratings) and in design pressures of 200, 300, 600 and 900 psig. Large water capacity gives the boilers exceptional ability in handling heavy peak and fluctuating loads.

Firing is by oil or gas or combination burners. Units are offered with complete burner and control assembly or boiler can be purchased separately, enabling the purchaser to select make and type of burners and controls desired in specification.

The boilers are enclosed in a gas tight insulated steel jacket of special sectional design and are suitable for outdoor, as well as indoor installation. Normally, units are shipped assembled ready for use after making fuel line, water, steam, and electrical connections. However, when necessitated by limited wall openings, the unique sectional casing and standardized sectional parts permit field assembly with minimum field labor, thus obviating the expense of tearing down building walls to gain access to inside locations.

Carboloy Tipped Masonry Drill

D-12 HOLUB INDUSTRIES, INC., Sycamore, Ill., has introduced a new masonry drill designed to overcome dust packing which causes stalling.

Feature of the Holub design is a combination of oval flutes, narrow lands and fast spiral which carries dust up and out of the hole as fast as it forms.

It is claimed that the drill, called "Hi-Twist," can be used for continuous drilling of concrete, stone, brick, and similar masonry materials as well as copper, brass and other soft metals. It can be used with any tool.

The drill is made of a very tough alloy steel and has a Carboloy tip—which resists dulling. The cost is comparable to other carbide tipped drills. Other advantages claimed are longer drill life and reduced drilling costs.

Sizes range from 11/64" to 1" for spiral fluted drills and 1⅛" to 1½" for straight fluted drills. Individually the drills are packed in a protective plastic tube. They are also available in handy roll kits of three and four popular sizes.

Steam-Jet Cleaner

D-13 LIVINGSTONE ENGINEERING COMPANY, Worcester, Mass., announces the new "Standard" Speedylectric Steam-Jet Cleaner, with automatic balanced control.

Featuring compact portability, fast action, operating simplicity, complete safety and all electric freedom from fire hazards, this new model is available for operation on 220, 440, or 550 volts a-c power. The operation of the steam generator, regulation of detergent flow and atomization with steam at the jet are all under fingertip control of the operator at the steam gun or lance.

The Steam-Jet Cleaners are meeting exacting requirements in many fields including industrial plants, hospitals, bakeries, hotels, restaurants, food processing plants, printing establishments, textile mills, oil refineries, foundries, and pharmaceutical and chemical works.

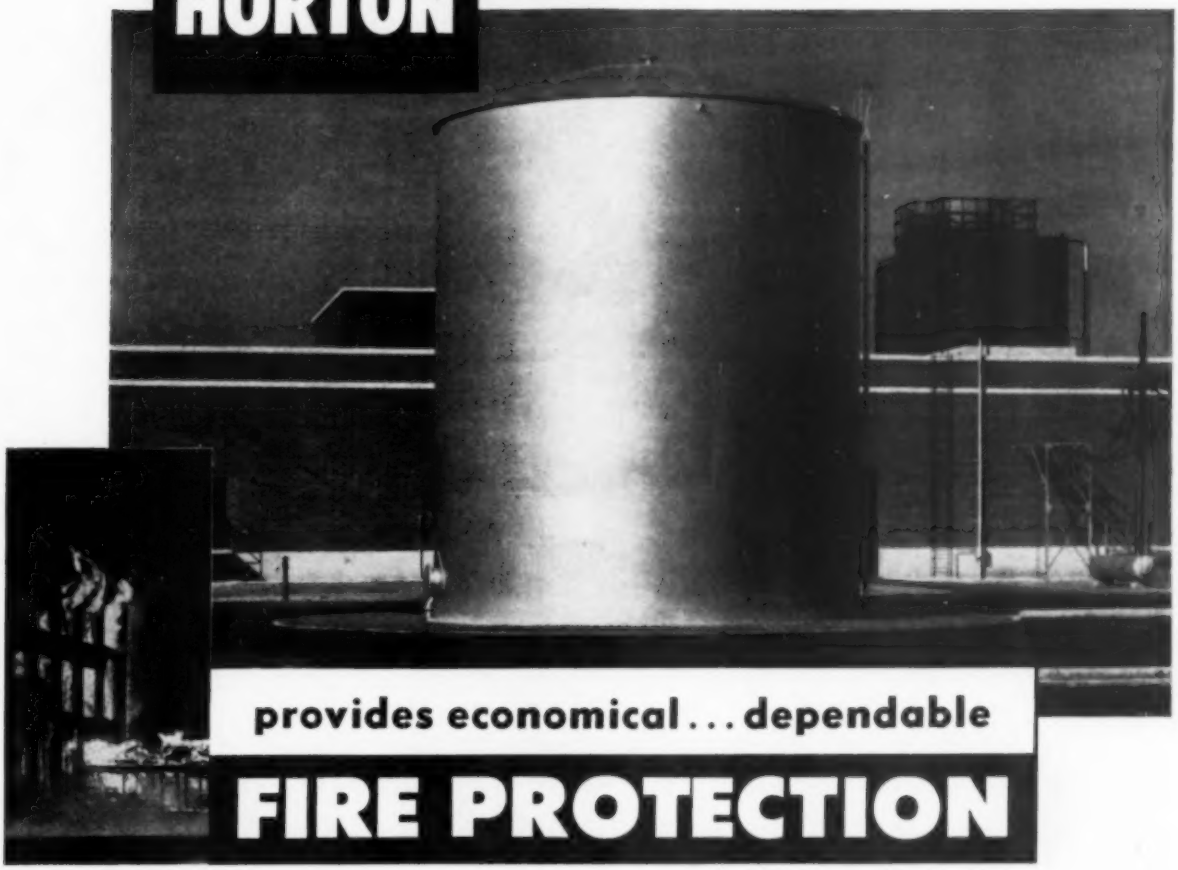
Precipitron Oil Mist Control Unit

D-14 WESTINGHOUSE ELECTRIC CORPORATION, Sturtevant Division, Hyde Park, Boston 36, Mass., is making available a completely redesigned Precipitron Oil Mist Control Unit that will recover the coolant oil from the mist and smoke generated by high speed cutting, grinding, milling, and similar machining operations.

Salvage or recovery of coolant oil is made possible by this oil mist control unit. Other advantages are: reduction in such industrial hazards as slippery floors, fire hazards, reduced illumination, and contaminated atmosphere; savings in heating costs by not exhausting usable heated or conditioned air; improvement in employe attitude that comes from working in clean surroundings; and reduction in building maintenance costs.

The unit is completely self contained: the heavy gauge sheet steel cabinet houses the all aluminum oil-particle charging and collecting elements with their high voltage power pack; the motor driven fan; duct connection; and oil sump.

HORTON SUCTION TANK



provides economical . . . dependable

FIRE PROTECTION

The 150,000-gal. Horton suction tank pictured above was installed to provide a water supply for the automatic fire protection system at the Textron Southern, Inc. plant in Honea Path, S. C. City water mains serve as the secondary source of supply.

The Honea Path plant manufactures fabrics which are sold under the name of Textron Southern, Inc. to other manufacturers throughout the United States for further processing. Generally the fabric is used in the manufacture of garments.

The plant's entire 82,000 sq. ft. of floor space is protected by an automatic sprinkler system which has 1,106 sprinkler heads. The Horton flat bottom tank which has an umbrella roof, provides suction for pumps that supply water to the sprinkler system. Protection such as this is dependable because the 150,000 gallons of water in the tank is on hand and always available if a fire should break out. It is economical because automatic fire protection prevents serious fires from developing and often results in reduced insurance premiums—a savings which helps pay for the system.

Horton welded steel suction tanks of the above type are built in standard capacities from 50,000 to 500,000 gals. Horton elevated water tanks for fire protection and general service are built in standard capacities from 15,000 to 500,000 gals. with ellipsoidal bottoms and from 500,000 to 3,000,000 gals. with radial cone bottoms. The Horton Watersphere . . . a pleasing, streamlined type of elevated tank . . . is built in standard capacities from 25,000 to 250,000 gals. For estimates or quotations on Horton structures, please write our nearest office. There is no obligation on your part.

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Havana.....402 Abreu Bldg.
Houston 2.....2132 C & I Life Bldg.
Los Angeles 17...1545 General Petroleum Bldg.
New York 6.....3312—165 Broadway Bldg.
Philadelphia 3....1646—1700 Walnut St. Bldg.
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new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

The fan motors are three-phase, fractional horsepower, ball bearing, prelubricated, totally enclosed, for 220 or 440 volt service. The power pack operates from a single-phase, 115-volt line and consumes less than 60 watts when operating.

Overhead Carrier With Hydraulic Scale

D-15 THE CLEVELAND TRAMRAIL DIVISION OF THE CLEVELAND CRANE & ENGINEERING CO., Wickliffe, Ohio, has introduced a new overhead traveling carrier equipped with a hydraulic cell scale.

The hydraulic cell is operated by a lever to which is fastened the upper hoist block. Resulting pressure is transmitted from the cell to the scale dial by hydraulic tubing. The scale weighs in pounds or kilograms, as desired.

Hydraulic cell scale permits weighing all loads handled, quickly and easily.

The motor-driven tramrail carrier has a travel speed of 300 fpm. The hoist has a speed of 38 fpm and a lift of 36 ft. Both travel and hoisting motors are provided with variable-speed controllers; in addition, the hoisting controller is designed for dynamic lowering. Load capacity of this unit is three tons.

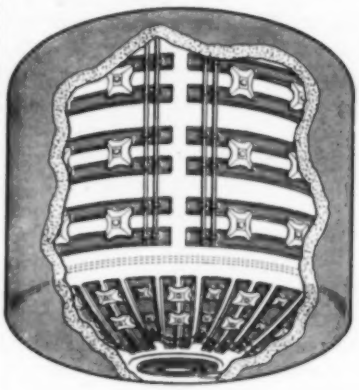
Careful consideration has been given to safety. A safety switch is provided in the cab and the travel motor is equipped with a foot-controlled electric brake. Also incorporated into the carrier is a weight-type limit switch which permits the operator to travel only when the load block is in high position. This assures clearing through openings of limited dimensions along the travel route safely. A screw-type limit switch is also provided for limiting the distance of travel when lowering.

Industry's Most Versatile Heat Source

Chromalox *Electric* Strip Heaters

Easy to Install CHROMALOX Electric Strip Heaters give clean, dependable and accurately controlled heat where and when heat is needed. They produce uniform and accurate temperatures by automatic or manual controls. Low initial costs, low installation costs and low operating costs are among the many advantages of using CHROMALOX Strip Heaters for heating liquids, gases, viscous fluids, tanks, platens, molds, moving parts, etc. Get the full details now.

A Typical Strip Heater Application From Our Files



Rugged, easily installed Chromalox Strip Heaters assure accurate temperature, dependable around-the-clock service.

Strip Heaters curved lengthwise at the factory fit snugly to tank perimeter and . . .

Strip Heaters curved slightly as installed conform to shape of convex kettle bottom, while . . .

Segment Heaters fill the gaps.

IC-50

CHROMALOX

Electric Heat for Modern Industry

Sizes, Types and Sheaths for Every Need
LENGTHS
4" to 96" lengths, 1" to 2½" widths, rings 2½" to 11" diameter; 115 to 460 volts.
CURVES & SEGMENTS
Curved in cross-section or formed lengthwise to desired radii.
TERMINALS
Varied terminal types for convenient wiring. 2 terminals at one end, centered, or at opposite ends; 3 terminals at same end of the unit.
SHEATHS
Rust-resisting iron, high temperature steel and Monel sheaths to meet exact service conditions.

Want Ideas?

on how to use Chromalox Electric Heaters in your plant

Write for the data-packed Catalog 50 which describes many types of Chromalox Electric Heaters and how to apply them. It's yours without obligation.

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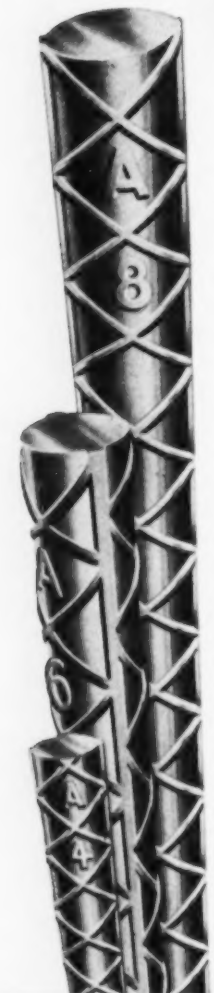


- REINFORCING BAR FABRICATION
- FORGINGS AND STAMPINGS
- HOT-DIP GALVANIZING
- HEAT-TREATING

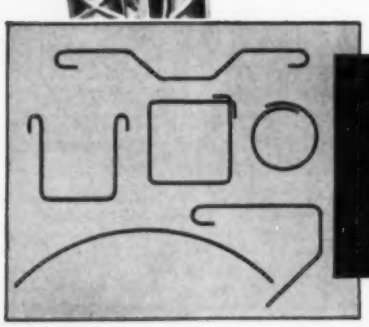
Increasing demand for mill fabrication of DIXISTEEL Reinforcing Bars has led to the resumption of this service, which we discontinued in 1942.

This service and those formerly provided by our Manufacturing Division now make up our Fabricating Division.

The latest bar-bending machines and cut-off shears are operated by specially trained crews. Engineers with fabricating and construction experience will detail your blue prints and drawings, and list bills of materials.

In addition to bar fabrication, forgings and stampings to customer specifications, hot-dip galvanizing and heat treating, we also offer facilities for upsetting, trimming, threading, punching, hot-bending, broaching, de-scaling, liming, pickling and oiling.

We'll be happy to tell you about these services and how they may be of special benefit to you. Just write, wire or phone.



FABRICATING DIVISION

Atlantic Steel Company

ATLANTA, GEORGIA • EMERSON 3441

Plant Expansion

Here's how Falstaff at New Orleans completed an extensive plant expansion program without interruption to process.

(*Starts on page* 50)

needed for the heating of brewing water.

Controllers and Recorders

The Republic combustion control panel which was mentioned earlier is a good example of the complete instrumentation throughout the plant to aid brewery workers in their jobs. All operations are automatically controlled where feasible, and a permanent record is kept by means of Taylor recorder-controllers.

A separate combustion control panel for each boiler includes the following equipment: draft indicator for each of the four burners; steam pressure gauge; feedwater pressure gauge; Yarway boiler water level indicator; feedwater flow and temperature recorders; boiler rating valve; boiler manual control station; CO_2 and exit gas temperature recorder; and push button for the forced draft fan.

In addition to this panel, each boiler is equipped with a complete combustion safeguards system, mounted on a separate panel for each boiler. Steam flow to each department is measured by Cochrane recording steam-flow meters, while electric current is also metered.

A 24 hour record of operating conditions in the refrigeration system is maintained through the use of Taylor recorders, which constantly measure temperatures and both suction and discharge pressures in the ammonia lines.

In another use of these versatile instruments, all lauter tub and brew kettle temperatures are recorded. Here again, all recorders, steam gauges, temperature indicating gauges and equipment controls are mounted on stainless steel panels conveniently located for efficient operation.

Each mash tank and cereal cooker is equipped with a Taylor Time Schedule Recording Fulscope Controller, which, with

Something New... Something Bigger!

IN A SINGLE PACKAGE

COMBUSTION CONTROL

From steam flow—air flow, or by the fuel air ratio method. Designed especially for the most modern central station boilers, but well suited for smaller units.

FEED WATER CONTROL

From three, two or one influences. Instrument or mechanical types to meet all operating conditions or preferences. Adaptable to all piping layouts.

STEAM TEMPERATURE CONTROL

Multi-element type. Through burner or damper positioning, gas recirculating, direct cooling-water spray or heat exchanger.

SOOT BLOWER CONTROL

May be full automatic-sequential control or individual push buttons. Each step in the blowing cycle can be reported back to the panel by signal or program lights.

MINIATURE or STANDARD INSTRUMENTS by *Taylor*

Miniature instruments, especially with auto-manual selector valves, are ideal for modern space-saving and graphic panels. Standard size instruments also available.

COPES-VULCAN DIVISION, CONTINENTAL FOUNDRY & MACHINE COMPANY, ERIE, PA.

ASK FOR BULLETIN 1007

COPES VULCAN

BOILER CONTROLS

Expect 5 *to* 8 YEARS *protection*

for galvanized towers from a

SINGLE COAT OF SUBOX

There's no better anti-corrosive pigment for painting over galvanizing than active suboxide of lead—the basic pigment in Subox and Subalox paints.

There's no surer way to get economical and effective preservation of galvanized structures than by coating them with Subox or Subalox. In most instances, a single coat is sufficient and Subox or Subalox—will not chip, crack or blister during years of exposure to the elements.

What's more, repainting is simpler and more economical when these paints are used. They cost no more than any good paints, and can be relied on to save you money for years.

Write for a free copy of "Paint Galvanized Transmission Towers for Long Life".

Subox Inc. 6 FAIRMOUNT PLANT HACKENSACK, N. J.

gauges and switches, is also mounted on a stainless steel panel.

Hot water used for the brewing process, called "sparge water," must be kept at an even temperature so that each brew is exactly like its predecessor. To maintain this temperature, Taylor recorder-controllers and Taylor air-actuated steam valves control the amounts of exhaust steam needed to keep the temperature even.

This "sparge water" is kept in tanks on the fourth and fifth floors of the brewhouse, and the flow of water to and from the tanks is controlled from a stainless steel panel located on the second floor. On this panel are located gauges, which indicate the temperature of water in each of the tanks and the water level in each tank, as well as the remote controls for the inlet and outlet valves on the tanks.

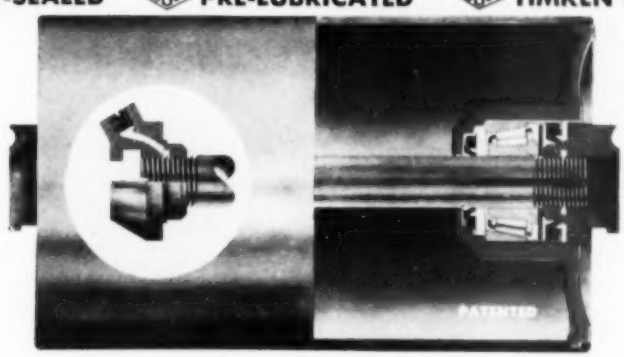
In connection with new stainless steel Mojonnier hot wort coolers, another complete control system was installed. Again, Taylor recorder-controllers are used to regulate the flow of well and city water through the water sections of the cooler in addition to the flow of ammonia through the ammonia sections of the cooler. From this one panel, the operator can control the entire wort cooling operation. A constant high rate of flow must be maintained so that the coolers will function in lowering the temperature of the hot wort from 200 F to 45 F.

Also located on this control panel are switches to control the well-water booster pumps, rated at 350 gpm at 90 ft head; the air actuated dampers in the air conditioning system; the two Weinmann bronze hot wort pumps, rated at 620 gpm; the indicating ammonia pressure gauges, wort temperature indicators, and wort temperature recorders.

Taylor recorder-controllers, actuating Cash ammonia back pressure valves installed on the ammonia suction lines of the air conditioning units, accurately maintain the temperatures of the many aging and storage cellars at the New Orleans plant. Taylor Flexo-Timers and Paragon timers are used to defrost automatically all cellar air conditioning units.

You Need... CONTINENTAL'S NEW UST Idlers

CGC UNIT-SEALED CGC PRE-LUBRICATED CGC TIMKEN BEARINGS



Saves Grease!
Saves Labor!
Saves Belts!
Long Life - THE ULTIMATE IN MINIMUM MAINTENANCE

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellant grease of a stable consistency with a wide temperature range for long life.

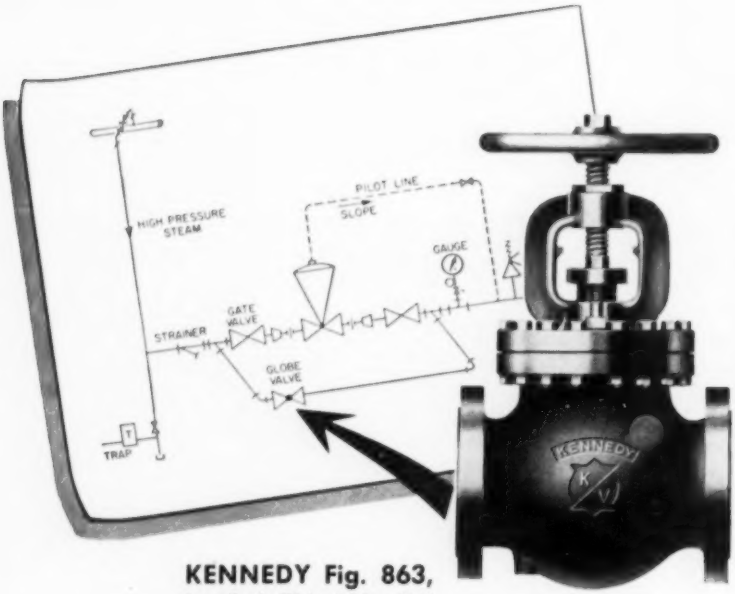
Most important—this construction permits operating the Continental "UST" Idler for extended periods of time without relubrication for 1-2-3 years or longer depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin S.I.-116

CG—5210

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS



KENNEDY Fig. 863,
Iron-Body Globe Valve. 250 pounds of steam at 500°F.

Here's how to set up pressure-reducing lines for easier maintenance

You naturally don't want to shut down a vital part of your operation when you repair a single valve.

You can avoid doing so by installing a by-pass around your pressure-reducing valve and installing a globe valve in the by-pass line. With this set-up you can use the globe valve for hand throttling when the reducing valve is removed from the line for repairs.

KENNEDY JOB-FITTED IRON-BODY GLOBE VALVES are designed and constructed for high pressures and severe service on steam or water lines and for heavy-duty service with oil, gas and other fluids that do not corrode bronze or iron.

Individual valves in the KENNEDY JOB-FITTED line are specially designed with the proper disc and seat trim to match the service for which they are recommended. Valves with either renewable composition or bronze faced discs are available, depending on the pressure in the line.

REPACK UNDER PRESSURE—You can repack ALL KENNEDY iron-body globe valves under full line pressure when wide open.

THE COMPLETE LINE of KENNEDY JOB-FITTED valves and INSPECTED fittings is sold through local distributors who are in a position to give you fast and convenient service.

THE **KENNEDY**
VALVE MFG. CO. • ELMIRA, N.Y.
Est. 1877
VALVES • PIPE FITTINGS • FIRE HYDRANTS

Georgia Paint Plant

(*Starts on page* 54)

Brooks packaged steam boilers supply plant heating. Natural gas is used but a fuel oil reserve tank is incorporated so that the system may be switched almost instantaneously in case of gas failure.

All working areas are painted according to the Pittsburgh Principles of Color Dynamics for Industry. Light-directing prismatic glass blocks are used in the upper portions of the office window areas with steel sash vision strips below. Solex heat-absorbing glass is used throughout the factory buildings. Interior lighting is provided by continuous rows of ceiling mounted fluorescent fixtures of an average intensity of fifty foot candles. Submerged under-floor ducts are provided for telephone and electrical connections throughout the building.

Pittsburgh Plate Glass Company products used in construction of the plant include window, plate, Solex heat-absorbing and Carrara structural glass, Herculite tempered glass doors, Foamglas insulation, prismatic light-directing glass block, paints, enamel, varnishes and putty.

The East Point operation is under the management of John F. Green, who was formerly manager, Trade Sales Service, at the firm's Milwaukee paint factory.

Robert & Company Associates of Atlanta were architects. Ira H. Hardin of Atlanta was the general contractor.

Annual Inventory

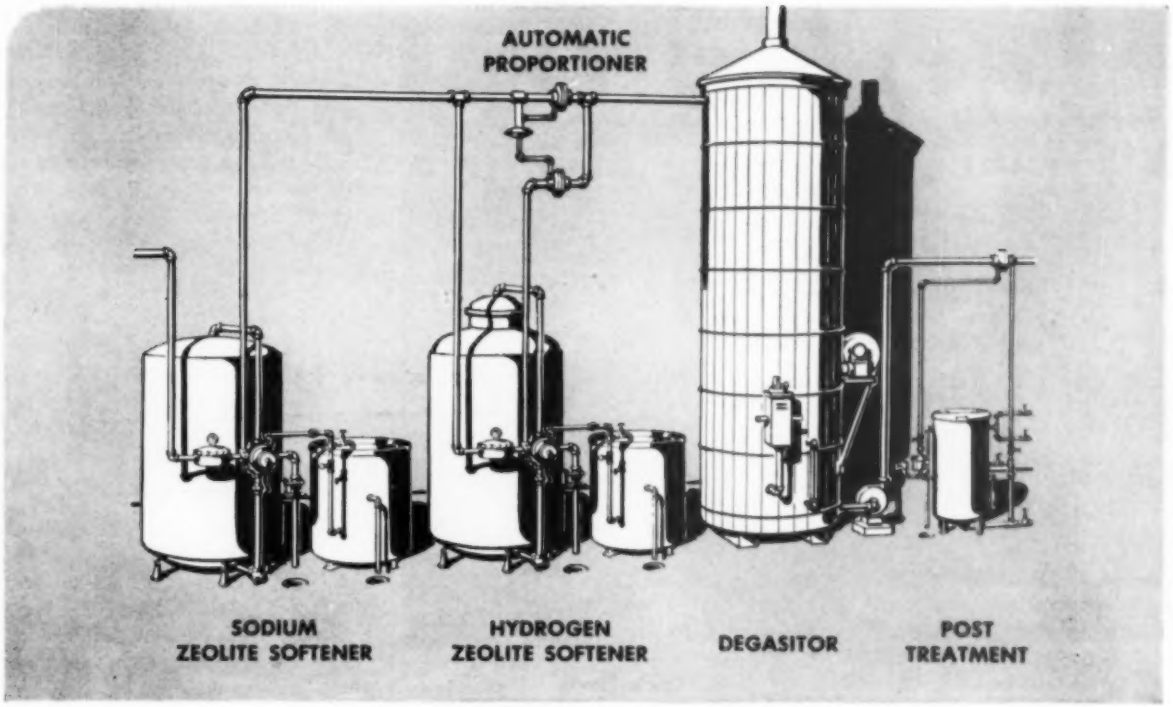
(*Starts on page* 64)

been completed. This saved considerable time in analyzing and inventorying assemblies in various stages of completion.

An area was set aside in which a quantity of empty skids and bins were placed in readiness for areas which needed these in connection with their counting work.

All steel in the steel storage areas was marked ahead of time with size and analysis in plain view.

The plant, both inside and out,



This Elgin "Split Stream DeAlkalizing" System

Eliminates Boiler Scale, Corrosion, and Excess Alkalinity At Taylor Oil and Gas Company

Taylor Oil and Gas Company, Corpus Christi, Texas is one more in a long list of well known firms that have selected Elgin Water Conditioning for their exacting requirements.

With the system graphically illustrated above, blended effluents from sodium and hydrogen zeolite water softeners, followed by degasification, give zero soft water in which total solids and alkalinity is reduced and CO_2 is removed. Boiler water alkalinity is kept in proper proportion to total dissolved solids. The dissolved solids have been reduced 34.5%. (On waters of higher alkalinity, a greater reduction is obtained.) Blowdown is reduced approximately 35%. Think how much this alone saves. Costly destruction resulting from return line corrosion is prevented. And as an extra dividend, post-treatment costs are cut to a minimum.

THIS CHART TELLS THE STORY

WATER CONSTITUENTS	RAW WATER Gr/Gal	TREATED WATER Gr/Gal
Carbonate (Alkalinity)	4.95	0.73
Sulfate	3.15	3.15
Chloride	4.08	4.08
Calcium	3.04	0.03
Magnesium	0.42	0.02
Sodium	3.66	4.68
Total Dissolved Solids	19.30	12.69
Reduction in Dissolved Solids		**34.5%**

Why Not Obtain Comparable Improvement in Your Boiler and Process Water?

A Complete Line To Meet Your Specific Needs

This is but one of our many water conditioning systems. We make all types, ranging from the outstanding "Double-Check" zeolite water softener which gives up to 44% more soft water, to the Ultra-Delonizer which produces water of the highest known chemical purity.

Write for details or let us put our nearest representative in touch with you.

Representatives in Principal Cities

ELGIN
SINCE 1908
WATER CONDITIONING
FOR EVERY NEED

ELGIN SOFTENER CORPORATION • 132 North Grove Avenue, Elgin, Illinois

In Canada: G. F. Sterne & Sons, Ltd., Brantford, Ontario

A COMPACT Turbine Blower Installation

Here is an example of the adaptability of the Wing Turbine Blower to the limitations of restricted space. Additional boiler installations at the E. R. Squibb & Sons, New Brunswick, N. J., plant left little space for auxiliary equipment. As the photograph shows, the complete Wing turbine and blower (47,000 CFM, at 5" s.p., at 1850 RPM) were placed beneath the rear boiler overhang and occupy a space but 54" in dia. by 33" high! (Another Wing unit occupies a similar space 45"x30".)

Compact design is but one of the many superiorities of the Wing Turbine Blower. In addition, they are quiet, rugged in construction, economical in operation and in maintenance. Wing Turbine Blowers cost nothing as a source of power when the oil free exhaust steam is used for process work, space heating or other uses requiring low pressure steam.

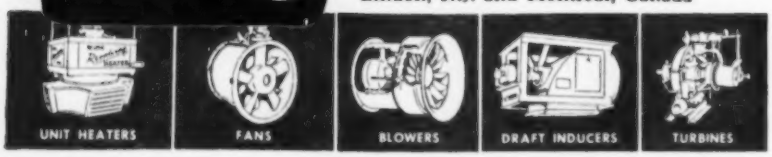
WING MOTOR DRIVEN Axial Flow BLOWERS are used on many of the country's leading makes of boilers as standard equipment. The reason lies in the consistently satisfactory performance they have been delivering for over half-a-century—plus the outstanding features of WING design, such as volume control (Voltrol Vanes) for capacity regulation down to 90%, ease of installation, quiet operation, compact construction, low maintenance cost. Wing Motor Driven Blowers give day-in-day-out, year-in-year-out satisfaction.

Type R Wing Turbine Blower

Write for a copy of Wing Bulletin SW-52

Wing

L. J. Wing Mfg. Co.
169 Vreeland Mills Road
Linden, New Jersey
Factories:
Linden, N.J. and Montreal, Canada



was broken down into inventory areas and each area assigned to an inventory supervisor. Crews were assigned to each supervisor sufficient to complete the inventory in not over eight hours. A crew consisted of two men, a counter and a checker. The counter makes a physical count and fills in all the information on the inventory tag. The checker rechecks the count, verifies the identification, signs the tag and removes the fly leaves which are then turned in to the tag clerk in the area. The tag clerk controls the inventory tags in his area.

Inspection Method

In years past, the percentage of rechecks ran very high. To correct this we provided a section to inspect the inventory as it progressed. This section has similar functions to an inspection department in a manufacturing process. They check very closely the first few tags written in each area to make sure the crews understand what they are supposed to do. They then spot check throughout the day to assure a good inventory. Before a given area can be released it must be approved as complete and accurate by the area inspectors and the tag clerk who is in charge of tag accountability.

Electrical Q & A

(*Starts on page* 66)

Q—What auxiliary equipment is required with a synchronous motor?

A—Synchronous motors designed for speeds below 500 rpm are commonly started on full line voltage by using an across-the-line starter. High speed synchronous motors are usually started by first applying reduced voltage and then switching over to full line voltage when the motor has accelerated to nearly synchronous speed. A reduced voltage compensator or auto-transformer is generally used for this purpose. After full voltage has been applied, the fields are excited.

It is desirable to have an ammeter to measure the motor line current, and an ammeter and volt-

"We 'educated' our College Heating Plant...

with a modern coal installation we saved more than a third of our fuel bill,"

says Mr. James Gribben, Chief Engineer of Bethany College, Bethany, West Virginia.

"Colleges watch operating costs as closely as any business firm—and one big item for our college is the heating bill. That's exactly why Bethany went to the expense of putting in new coal heating equipment! Our old system supplied heat for sixteen buildings—to the tune of 2,600 tons of coal a year. Our new installation, with its automatic stoker, does the same job using only 1,650 tons. That's a fuel saving of 38.9%! Our eyes certainly have been opened to the efficiency and economy of *bituminous* coal—especially when it's burned with modern equipment."

Here's Bethany's new boiler room, showing the pipe of the automatic stoker. **THIS MODERN EQUIPMENT WILL PAY FOR ITSELF, THROUGH FUEL SAVINGS ALONE, IN LESS THAN TWO YEARS!**

Modern combustion installations can add anywhere from 10% to 40% to the energy obtained from the same amount of coal in years gone by. Great advances have been made in coal- and ash-handling equipment, too—cutting labor costs—making coal as clean and convenient to use as any fuel.

If you're planning to modernize your present installation—or thinking of building a new plant, call in a competent consulting engineer. He'll show you how a modern coal system designed to meet your specific needs can save you money and serve you better!

And don't forget—you'll always be able to get the coal you need. America's coal industry is the most efficient in the world. America's coal reserves are ample for centuries to come. Right now and for the future, too, coal users can be assured of a dependable fuel supply at reasonable prices.

BITUMINOUS COAL INSTITUTE
A Department of National Coal Association
Washington, D. C.

If you're running your own steam plant—for heat or for power—you just can't afford to ignore these facts!

COAL in most places is today's most economical fuel.

COAL resources in America are adequate for all needs—for hundreds of years to come.

COAL production in the U.S.A. is highly mechanized and by far the most efficient in the world.

COAL prices will therefore remain the most stable of all fuels.

COAL is the safest fuel to store and use.

COAL is the fuel that industry counts on more and more—for with modern combustion and handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

FOR HIGH EFFICIENCY — FOR LOW COST

YOU CAN COUNT ON COAL!

Okadee

"THE PERFECT SEAL"

WRING FIT

No magic . . . No magnetism . . . lapped wring fit of every Okadee Valve disc and seat must pass this test of a perfect sealing surface. (unretouched photo)

. . . Here's What it Means to You in Terms of Valve Service

Flat mating surfaces within .000005", or less, of every set of Okadee valve discs and seats mean absolute shut-off of any material from ammonia gas to asphalt.

How long does this seal last in service? We honestly don't know. Tests under working conditions with propane were stopped after 269,000 operating cycles when no wear or seal failure could be detected. And Okadee valves do not have to be babied in service on corrosive or abrasive materials . . . Thousands of boilers have had Okadee blow-down valves in continuous, trouble-free service for fifteen years or more. If Okadee size-pressure-temperature ranges include your valve applications, Okadee installation will end your problems of valve performance once and for all.

Okadee valves are available in single-disc (one direction) and double-disc (two directions) types; screwed or flanged; ½" to 6" in standard A.S.A. dimensions; steel or semi-steel bodies (other materials to order); stainless steel or stellite seat facings; levers, rack-and-lever, worm-gear, hydraulic, pneumatic, automatic on-off control.

Write for Bulletin 332-H today!

OK'd Okadee COMPANY

332 South Michigan Avenue • Chicago 4, Illinois

meter for the exciter. These instruments are generally mounted on a panel with an oil circuit breaker, or starter, and a motor and exciter field rheostat.

The exciter can be either of the direct connected or belted type, or the current for excitation may be supplied from some other source.

First Impressions

(*Starts on page* 70)

ness with this fine customer. The customer in some way became aware of this situation and decided to do something about it.

Consultation with the Police Department Traffic Bureau brought out the facts that visiting salesmen were being penalized for what was not deliberate flouting of the law, but the necessities of their job as distinguished from purely local people who might carelessly overpark.

The solution was an arrangement between the Police and the company's management whereby visiting salesmen who found a parking ticket on their car would simply give it to the Information Girl. At the end of the day it would be turned in to the Police Traffic Bureau with data as to times of arrival and departure (from the Visitors Registers) of the individual whose car was ticketed. It could be seen that this was no careless local driver but a visitor at the plant on legitimate business and such tickets would be canceled.

A notice is posted at the Information window in the Reception Room stating in effect:

If your car is ticketed while on a call at the plant, give it to the Information Girl and go on about your business, the ticket is being taken care of by the management.

That is a splendid example of consideration for business callers and contributes great good will to the company on the part of visiting salesmen.

There are other instances of conditions unfavorable to good public relations, but the preceding examples will be sufficient to indicate the directions in which management may look to determine where

Lugs, insulators, bell shapes, and cable entrances are all interchangeable. This is an important feature of AnacondA Potheads.

ANACONDA POTHEADS

This complete line is engineered by power-cable specialists for use with *any* make of cable. Parts are *fully* interchangeable for greater adaptability, faster delivery, easier installation and lower cost.

Not hundreds—but thousands of different ANACONDA Potheads can be made up from relatively few interchangeable parts. There's a type for every use—capnut, transformer, switchgear, disconnect, and through types.

Replacement of damaged insulators is simple on AnacondA Potheads. Note the ease with which any insulator can be quickly inserted.

Over 2000 different pothead assemblies can be furnished from standard parts for any particular conductor size and voltage rating in the multi-conductor capnut type alone!

To keep pace with the increasing demand for ANACONDA Accessories, it has been necessary again to greatly increase the facilities of the Cable Accessories Department. This Department is now in a position to promise prompt shipment on most of your orders.

Service continuity demands both power cable and its accessories built to highest standards. Top performance from ANACONDA Cable Accessories is assured because they are designed by engineers who are power-cable specialists.

Make Anaconda your headquarters for potheads, jointing kits, insulating compounds, paints, etc. For help on your cable and installation problems call on your Anaconda Representative to get the benefit of Anaconda's engineering experience. 52461

Accessories for all types and sizes of bare and insulated conductors.

ANACONDA®

Anaconda Wire & Cable Company,
25 Broadway, New York 4, N. Y.

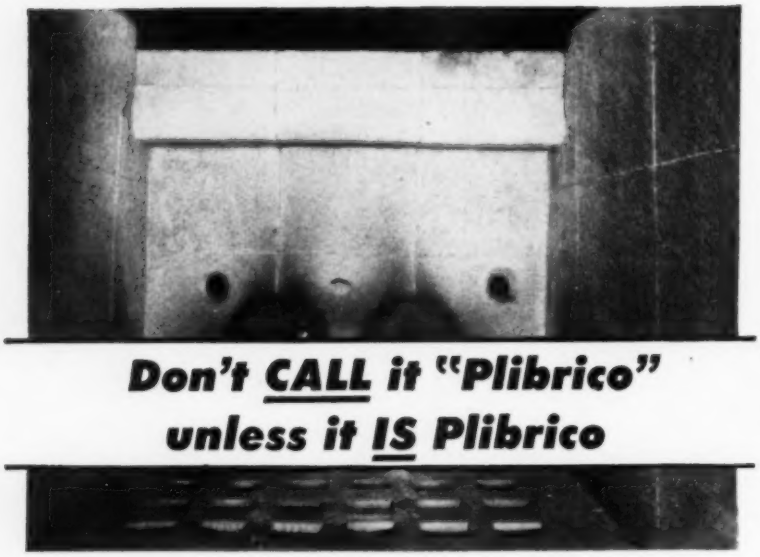
Send me Anaconda's new 100-page Pothead and Terminal Catalog for use as a reference book and to simplify ordering and specifying.

NAME.....

FIRM.....

ADDRESS.....

CITY.....STATE.....



Don't CALL it "Plibrico" unless it IS Plibrico

Every now and then we find that some people are calling all plastic refractories "Plibrico" . . . just as they often call all cameras "Kodaks", all refrigerators "Frigidaires", and all phonographs "Victrolas".

Since Plibrico pioneered plastic, jointless refractory products, it isn't at all surprising that some folks have tried to make a generic term out of the name Plibrico.

We certainly appreciate the tribute. But it can cause misunderstanding, and users of refractory products could be disappointed by something they thought was Plibrico when it wasn't Plibrico at all. Let's set the record straight:—

There's only one Plibrico in the plastic refractory field. Plibrico is a trade name, not a generic term, and it appears on every carton of our material. Originally, the name Plibrico stood for our jointless firebrick. So completely did this refractory revolutionize furnace lining that a whole group of refractory products grew out of it. Hand in hand came the construction methods, the engineering features, and the service—so that now Plibrico is not only the trade name of a plastitc refractory, but much more.

Today Plibrico stands for fine refractory products, skilled engineering, expert construction, and above all, service. Though it means all these things, remember that it does identify just one brand of plastic refractory. Be sure you see the name Plibrico on the box.

All Plibrico products and services are available through your local Plibrico Sales & Service organization. Our catalog tells the whole story: send for your copy.

ONLY THIS IS **PLIBRICO**
. . . the original plastic refractory.

AND ONLY FROM **PLIBRICO**
. . . PLICAST castable refractories.

PLIBRICO *ENGINEERING*
brings you the vast Plibrico knowledge of furnace lining and setting design.

PLIBRICO *CONSTRUCTION*
embraces accessories and methods which assure efficient construction.

Plibrico Company
1800 Kingsbury St., Chicago 14, Ill.
PLIBRICO SALES & SERVICE IN PRINCIPAL CITIES
REFRACTORY PRODUCTS • ENGINEERING • CONSTRUCTION

evils may exist. Salesmen, if sincerely asked, can be most helpful in your "search," and they will certainly remember your interest in this often-neglected phase of public relations.

Vibroflotation

(*Starts on page* 72)

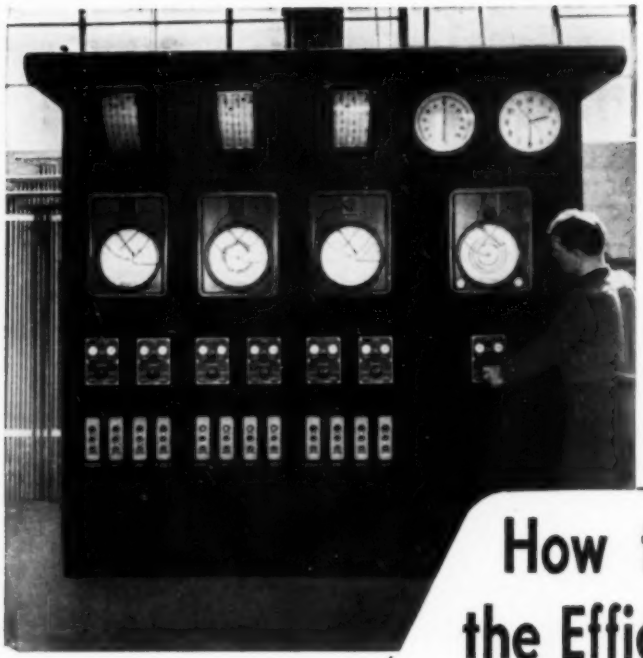
full speed, it is lowered into the sand while a water jet at its tip forms a saturated sand mass or temporary "quick sand" condition, into which the vibrator rapidly sinks. It was lowered to an average depth of 13 ft at Bonnie.

The device by its vibrating action pounds the sand surrounding it into a tighter mass on all sides. Fresh sand is shoveled in from above to fill the extra space emptied by this compaction.

The vibrator is withdrawn in one-foot stages, being run at each until the sand is packed as solidly as practical at each stage. An average of 2½ cu yd of fresh additional sand is added by the time it is fully withdrawn. The result is a tightly compacted sand column about 8-10 ft in diameter. The columns are pounded in pre-determined overlapping pattern with about 8 ft between centers. The pattern greatly strengthens the compaction results which give a relative density of 70 to 100 per cent more than enough for high or very high bearing capacity.

The complete compaction at Bonnie Plant took two crews 160 days for some 3,350 compactions. Results show, after six months, that one of the first structures completed, the phosphate storage building, has experienced no measurable settlement. Advance estimates, however, had allowed for a maximum settlement of approximately one inch.

Rust Engineering sees a future for this technique in construction of earth dams, cofferdams, levees, and airports in sandy areas, as well as to provide foundations for heavy industrial plants where vibrating equipment is installed. Another special use is in water retaining dams and underwater structures where Vibroflotation concrete can create unusually tight structures.



These Bailey Boiler Controls at the Chicago Pneumatic Tool Company's new plant in Utica, N. Y. insure efficient operation of three 25,000 lb per hour, 100 psi, spreader stoker-fired boilers

How to INCREASE the Efficiency of YOUR BOILER-ROOM DOLLAR

Before you get steam you've got to spend dollars—so dollars are a form of energy.

And if your boiler-room dollars are invested in equipment that isn't working efficiently, economically, your "investment" is poor.

That's where co-ordinated controls by Bailey can help. Here's why they'll increase your "boiler-room investment efficiency":

1. **Complete Range of Equipment—fully co-ordinated.** You need never worry that a Bailey Engineer's recommendation is slanted in favor of a particular type of equipment, just because he has a limited line to sell—or that Bailey will pass the buck for efficient control; we offer *complete* boiler control systems.

2. **Engineering Service—backed by experience.** No other manufacturer of instruments and controls can offer as broad an experience, based on successful installations involving all types of combustion, flow measurement and automatic control.

3. **Direct Sales-Service — conveniently located near you.** Bailey Meter Company's sales-service engineers are located in more industrial centers than those of any other manufacturer of boiler control systems; you get prompt, experienced service with a minimum of travel time and expense.

•

For better "boiler-room investment" efficiency —for more power per fuel dollar, less outage and safer working conditions, you owe it to yourself to investigate Bailey Controls. Ask a Bailey engineer to arrange a visit to a nearby Bailey installation. We're proud to stand on our record: "More power to you!"

Address

BAILEY METERS

BAILEY METER COMPANY

1028 IVANHOE ROAD
CLEVELAND 10, OHIO

Controls for Steam Plants
COMBUSTION · FEED WATER
TEMPERATURE · PRESSURE
LIQUID LEVEL · FEED PUMPS

NEWS for the South and Southwest

Bruce E. Sherrill Joins P. H. Nichols & Company

BRUCE E. SHERRILL, has joined the P. H. NICHOLS & COMPANY, contracting mechanical engineers, 903 Whitehead Bldg., Atlanta 3, Georgia.

Bruce E. Sherrill now with P. H. Nichols & Company, contracting mechanical engineers of Atlanta and Charlotte.

Mr. Sherrill attended Alabama Polytechnic Institute and later graduated from M.I.T. He worked as a construction engineer with the American Steel and Wire Co., and later as a welding engineer with the Wear-Ever Cooking Utensil Co. He joined the Grinnell Company in 1929, serving as a sales engineer in Philadelphia and various branch offices, and since 1943 he has been manager of the industrial piping division for Grinnell in Atlanta. He is a member of the Georgia Engineering Society, A.S.M.E., and is a Registered Professional Engineer in the State of Georgia.

P. H. Nichols & Company represents the Riley Stoker Corporation, The Swarthwout Company, Brooke Engineering Co., Inc., Schutte & Koerting Co., Pittsburgh Piping & Equipment Co., and The Williams Gauge Co.

P. H. Nichols & Company also maintains a branch office at 221 Builders Bldg., Charlotte, N. C., with H. H. Griswold, manager.

FUTURE EVENTS Of Engineering Interest

NATURAL GASOLINE ASSOCIATION OF AMERICA, Wm. F. Lowe, Sec'y, 422 Kennedy Bldg., Tulsa 3, Okla.

Feb. 27, Regional Meeting, Scharbauer Hotel, Midland, Texas.

April 29-May 1, 32nd Annual Convention, Rice Hotel, Houston, Texas.

SOUTHERN SAFETY CONFERENCE, W. L. Groth, Exec. Dir., Box 8527, Richmond 25, Va.

Mar. 1-3, 14th Annual Southern Safety Conference & Exposition, Atlanta Biltmore, Atlanta, Ga.

MATERIALS HANDLING SHOW, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

May 18-22, Fifth National Materials Handling Exposition and Conference, Convention Hall, Philadelphia, Pa.

EXPOSITION OF BASIC MATERIALS FOR INDUSTRY, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

June 15-19, Exposition and Conference, Grand Central Palace, New York 17, N. Y.

AMERICAN WELDING SOCIETY, National Secretary, 33 West 39th St., New York 18, N. Y.

June 16-19, National Spring Technical Meeting with Welding and Allied Industry Exposition, Shamrock Hotel and Hall of Exhibits, Houston, Texas.

James P. Warren Promoted by Dow Chemical's Texas Div.

JAMES P. WARREN, superintendent of the Plant B Power Department, Texas Division of the Dow Chemical Company, Freeport, Texas, has been advanced to a new post as power consultant for the Texas Division.

James P. Warren, now power consultant, Texas Division, Dow Chemical Company.

Mr. Warren joined the Dow organization in September, 1942, as superintendent of power for Dow Magnesium Corporation. His earlier career included 35 years experience in power plant operation and construction work. Warren is a member of A.S.M.E., in which he has held several offices, and he holds patents on a chlorination process and a wind pressure gauge. He is a licensed professional engineer in both Texas and Florida.

Holland Promoted by J. J. Finnigan—Atlanta

WILLIAM J. MCALPIN, President, J. J. FINNIGAN CO., INC., has announced the promotion of WILLIAM CLYDE HOLLAND to Assistant Plant Superintendent.

William C. Holland, Asst. Plant Supt., J. J. Finnigan Co., Atlanta, Georgia.

Mr. Holland has a long record of service with J. J. Finnigan Co., having joined the staff in 1936. Since that time he has worked in every phase of production in the plant. Before his current promotion, he was Layout Supervisor.

Other officers of the company are Mr. C. F. Breen, Vice-President, Mr. L. I. Chafin, Vice-President, and Mrs. M. E. McAlpin, Secretary and Treasurer.

J. J. Finnigan Co. fabricates aluminum, copper, stainless steel, and stainless clad tanks, steel smokestacks, smoke breechings, and air compressor tanks.

De Walt, Inc. Southwestern Territory

JEROME H. EIGENBERGER, district manager for DEWALT INC., subsidiary of American Machine & Foundry Co., and makers of a complete line of power cutting tools, was recently assigned a new territory in the southwest.

Mr. Eigenberger joined the DeWalt firm early in 1952 as district manager for the Milwaukee area, and has since served in that capacity. Before joining DeWalt, he was Chicago branch representative for the Kohler Co. In his new position he will be DeWalt district manager in a territory comprised of southern Texas, southern Mississippi, and the entire state of Louisiana. Mr. Eigenberger will make his new residence in Houston, Texas.

NEW 16-page CATALOG

gives all the facts on the

REVOLUTIONARY
Sier-Bath
Flexible
GEAR COUPLINGS

Illustrates These *Sier-Bath* Advantages:

- 3/5 Usual Size, 1/2 Usual Weight
- Assembled, Uncoupled in seconds!
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Gives design explanation, advantages, application . . . complete technical data on all types . . . engineering information, etc. Standard types (below) sizes ⅞ to 6, HP 4 to 600 per 100 RPM. Special types, sizes to order. Ask your Distributor, Representative, or write us.

***Sier-Bath* GEAR and PUMP CO., Inc.**
9263 Hudson Blvd., North Bergen, N. J.
Established 1905 Member A.G.M.A.

Also manufacturers of Precision Gears, Screw and Gear Pumps

Standard Mill Motor Vertical Shaft Spacer Floating Shaft

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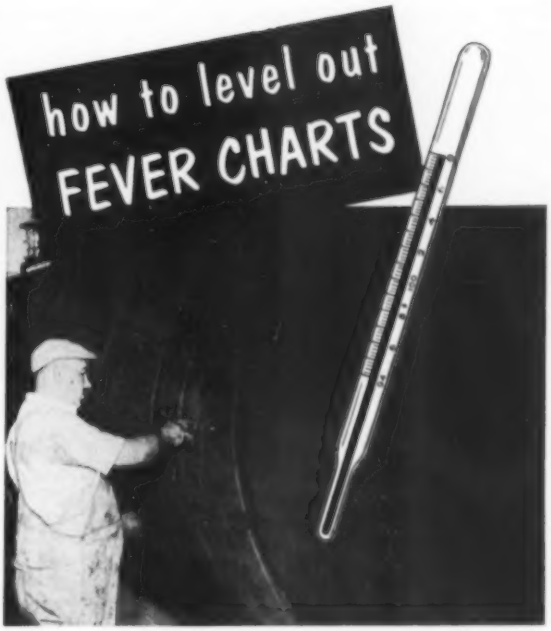
For information and service call or write:

ATLANTA, GA.,	Ira M. Valentine
BALTIMORE 11, MD.,	Ray V. Watson Co.
BATON ROUGE, LA.,	Louisiana Bearings Co.
BIRMINGHAM 4, ALA.,	Owen-Richards Co., Inc.
CHARLOTTE, N. CAR.,	M. R. Snyder Co.
CHATTANOOGA, TENN.,	Electric Motor Sales & Supply
HOUSTON, TEXAS,	South Western Gear Works
KANSAS CITY, MO.,	Associated Bearings Co.
MEMPHIS 2, TENN.,	Hays Supply Co.
NASHVILLE 3, TENN.,	Tennessee Machinery Co.
RICHMOND, VA.,	Russell R. MacDonald Co.
SAVANNAH, GA.,	Georgia Supply Co.
ST. LOUIS, MO.,	Roland L. Lawrence, R-J Bearings Corp.
TAMPA 1, FLA.,	Tampa Armature Works
THOMASVILLE, GA.,	E. J. Williamson Elec. Co.



Easily applied, highly efficient.....Ideal for maintenance work.....

No. 1 Insulating Cement

Here is the low cost answer to cutting heat losses on all types of equipment. B-H No. 1 Insulating Cement may be applied over block or blanket—or direct to large and small irregular surfaces not suited to preformed insulation. It has high coverage, low volume shrinkage—and contains a rust-inhibitor which prevents corrosion of equipment.

B-H No. 1 is effective up to 1800° F. and is 100% reclaimable when removed from equipment heated up to 1200° F. . . . If you have any problems of selection or application of any insulating material, put the job up to B-H Engineered Insulation Service.

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Please send complete information on

- ☐ **NO. 1 INSULATING CEMENT** . . . All-purpose, rust-inhibiting, plastic cement
- ☐ MONO-BLOCK . . . Rigid, felted black rockwool block—for high and low temperature use
- ☐ POWERHOUSE CEMENT . . . High adhesion, black rockwool insulating-finishing cement
- ☐ BLANKETS . . . Metal-reinforced, flexible, felted black rockwool insulation

Parker Appliance Co.
Shreveport, Louisiana

The appointment of the STANDARD BRASS & MANUFACTURING COMPANY, Shreveport, Louisiana, as a distributor of industrial tube fittings and tube fabricating tools manufactured by THE PARKER APPLIANCE COMPANY, Cleveland, Ohio, was recently announced.

Standard Brass & Manufacturing will maintain stocks of Parker fittings in a wide range of sizes at its Shreveport headquarters, 1557 Texas Avenue. This distributor has on call the services of M. L. "Jack" Sheehan, Parker industrial sales engineer for the Southwest territory. Standard Brass specialists will also be available for engineering assistance in the application of Parker products to hydraulic and other fluid-handling systems.

LOOK FOR THESE FEATURES IN STEEL GRATING

1. STRENGTH
2. SAFETY
3. LOW UPKEEP
4. LONG LIFE
5. SELF-CLEANING

BLAW-KNOX ELECTROFORGED® GRATING *gives you all five*

Regardless of what features are most desirable for your steel grating, you get what you want when you specify "Blaw-Knox." Its electroforged, one-piece construction provides exceptional *strength*, and the twisted cross bars give you a *safe* walking surface. The clean-cut openings—without angle irons—make it *self-cleaning* and easy to paint . . . contribute to *low upkeep*. Blaw-Knox Steel Grating has *long life* because there are no holes or crevices to trap moisture and encourage corrosion. Get the complete story on Blaw-Knox Grating and Stair Treads—write for Bulletin 2365 today.

We factory-fit Blaw-Knox Grating to your dimensions for easy installation.

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Blaw-Knox Equipment Division
BLAW-KNOX COMPANY
2034 Farmers Bank Bldg., Pittsburgh 22, Pa.

BLAW-KNOX ELECTROFORGED® STEEL GRATING

Harry P. Leu, Inc.
Miami Branch

HARRY P. LEU, INC., distributor of nationally-known machinery and industrial supplies throughout the state of Florida, announces that effective January 1st, a sales office and display room will be opened at 22 NW 20th Street, Miami.

E. H. "Hank" Register, manager of new Miami, Florida, office of Harry P. Leu, Inc.

E. H. "HANK" REGISTER, Miami resident for many years, and well-known in the industrial supply field, will be in charge. The regular Leu southeastern representative, H. BURTON HENDRIX, former Orlando resident now living in Coral Gables, will continue to serve the area through the new office.

Representing more than 750 leading manufacturers, Harry P. Leu, Inc., has been supplying the needs of Florida customers since 1900. Its wide range of stock items covers practically anything from screwdrivers to 16-foot metalworking precision lathes.

Fire Technology

Stepping up its scientific fight against fire, SOUTHWEST RESEARCH INSTITUTE, San Antonio, Texas, has named CALVIN H. YUILL, a nationally-known authority in building materials research, as director of its Fire Technology Division.

The Fire Technology Division serves industry and the public through use of the large research staffs and facilities of its departments of chemistry and chemical engineering, physics, engineering mechanics and all other operating departments of the organization as needed.

Mr. Yuill, who previously was serving as assistant director of the division, is well known as an authority on housing and building codes. The division's former director, Norman C. Penfold, was recently named as associate director of the Institute and also serves as assistant to the president.

Barco Appoints—North and South Carolina

Appointment of THE ROBT. E. MASON COMPANY, 1726 Hutchinson St., Charlotte, N. C., as sales and service representative for the states of North Carolina and South Carolina is announced by Barco Manufacturing Co., Chicago maker of revolving joints, flexible ball and swivel joints, and swing joints for providing for movement and flexibility in piping.

Robert E. Mason, head of Robt. E. Mason Company, Charlotte, N. C.

Mr. Mason, and his staff are well known throughout this territory as representatives for engineering specialties and equipment used by textile, chemical, and other industrial plants in the Carolinas. In representing Barco, the Mason company is concentrating particularly on Barco revolving joints which are used extensively by textile mills.

National Distributor for New Boiler Water Treatment

The STRONG, CARLISLE AND HAMMOND COMPANY, Cleveland, Ohio, identified for over 50 years with Strong steam traps, reducing valves and steam specialties, has announced its appointment as national distributor for the Borgana boiler water treatment.

Several unusual claims are made for this product which is a liquid extracted from Red Cedar wood by a complex process. By simply adding approximately one quart of Borgana per 100 hp per week, complete boiler treatment is claimed, existing scale is softened and gradually removed, and further scale formation prevented. It is claimed that the compound will absorb oxygen and other corrosive gases commonly found in boilers, thereby eliminating corrosion, pitting, foaming, and embrittlement.

To meet the demand for the product, Strong, Carlisle and Hammond plans to appoint some 200 distributors to handle Borgana.

BELMONT
PACKINGS
for WATER...STEAM...OIL...

BELMONT 9 . . . for all hydraulic services from low pressures to extremely heavy duty, hot and cold water.

BELMONT 19 . . . for hot and cold water rods and plungers; low and intermediate steam rods.

BELMONT 30 . . . for high pressure steam rods, expansion joints, air, and gas.

for better sealing—LONGER

Regardless of the temperatures or pressures involved . . . no matter what the lading . . . *your* equipment maintenance costs can benefit from longer, more dependable packing life. If you're *paying* for the best—and you probably are—make sure you *get* it by specifying BELMONT Packings in formulations suited to your particular needs.

Don't make do with the next best—*insist* on BELMONT . . . available in a wide range of materials . . . hundreds of styles and types . . . through distributors everywhere.

For technical assistance on packing specifications, write direct—ask for Catalog #40 or detail your particular problems. 4-M-1

$1,000,000 Order for Kirby Lumber Co.—Texas

The WESTINGHOUSE ELECTRIC CORPORATION has been awarded a contract for nearly $1,000,000 worth of electrical equipment for the KIRBY LUMBER Corporation's new lumber mill at SILSBEE, TEXAS. This mill will be one of the largest and most modern in the South, occupying 250 acres and employing 600 people. It will have a reserve of 550,000 acres of timberland.

The electrical equipment will include turbine generators, switchgear, power centers, and electric log carriage drives in addition to quantities of smaller equipment such as conveyor gearmotors and lighting fixtures.

The four log carriages will be driven by d-c motors through gear units, and direct current will be supplied for each drive by 400-hp motor-generator sets. Although the weight of a carriage plus log will run up to 39,500 pounds, smooth, rapid operation will be obtained by the use of magnetic amplifier regulators. A master controller will put control of carriage speed literally at the sawyer's fingertips. The two turbine generators will be 3500-kw condensing automatic extracting units operating at 3600 rpm.

The mill and its facilities were designed by H. E. BOVAY, JR., Consulting Engineers, Houston, Texas. The Houston firm of W. S. BELLOWS CONSTRUCTION CORPORATION has begun work on the ten million dollar project, which will include eighteen buildings and some ten miles of railroad trackage.

"JOHN CRANE" SUPER SEAL PLASTIC PACKING No. 1

Boiler plant operators of high speed centrifugal boiler feed pumps have long been looking for a satisfactory packing for these important units. Speeds have advanced from 1750 rpm. in 1910 to 5000 rpm. today, with shafts ranging up to 3½" diameter. Handling hot condensates up to 430°F. and pressures to 1250 psi. are no longer uncommon. High speed centrifugal boiler feed pumps go into service with lightning speed. The friction heats ordinary packing in a very short time. The oil and lubricants in these packings are boiled out and the asbestos seizes around the pump sleeves. Extensive damage and costly shutdowns result.

"JOHN CRANE" Super Seal Plastic Packing No. 1 is different!

This packing has a dry flake graphite lubricant. Every asbestos fiber is impregnated with graphite. The body of the packing is a combination of non-frictional metal particles. Asbestos fiber, graphite and rubber binder are semi-vulcanized as a mass, forming a resilient, flexible, non-frictional, strong packing.

"JOHN CRANE" Super Seal Plastic Packing No. 1 compresses satisfactorily under gland pressure to provide a perfect fit in the stuffing box. With proper lubrication, the packing runs cool and seals with minimum leakage. There is no lubrication to run out. The graphite surfaces polish the sleeve.

Operating engineers prefer "JOHN CRANE" Super Seal No. 1 for high speed centrifugal boiler pump service. Supplied in spirals, coils and die-formed rings and sets to fit all stuffing boxes.

Write today. Ask for our illustrated catalog. Crane Packing Co., 1839 Cuyler Ave., Chicago 13, Ill.

JOHN CRANE CRANE PACKING COMPANY

Fairbanks Company Opens Rome, Georgia, Branch

James L. RAGLAND has been appointed manager of the new Rome, Georgia branch of the FAIRBANKS COMPANY.

James L. Ragland will supervise entire Southern sales organization of the Fairbanks Company.

Previously the representative of the Fairbanks Company in the Birmingham, Alabama area, Mr. Ragland, in his new capacity, will supervise the entire Southern sales organization of the company. The new Rome office to be managed by Mr. Ragland will maintain a complete stock of Fairbanks Bronze and Iron Valves, Trucks, Casters and Wheels as well as Dart and "Pic" Unions.

Copes-Vulcan Birmingham, Alabama

COPES-VULCAN DIVISION, Continental Foundry & Machine Company, 939 West 26th Street, Erie 4, Pennsylvania, announces the appointment of W. E. VEENSCHOTEN, 27 Gaywood Circle, Mountain Brook, Birmingham, Alabama, as representative for Copes-Vulcan products, including the new Copes-Vulcan boiler controls with instrumentation by Taylor.

Foxboro Announces New Kansas Branch

THE FOXBORO COMPANY, Foxboro, Mass., manufacturer of industrial instruments for measurement and control, has opened a new branch office at Wichita, Kansas, to serve instrument users in that area. Located at 2207 South Pinecrest, the new branch brings the Foxboro total to 42 offices within the United States, reflecting the growing demand for instrument engineering in all phases of industrial processing.

Appointed resident engineer at the Wichita Office is MR. DALE G. HUGLEY, who moves to his new assignment after several years of service with the Tulsa Branch as Industrial Engineer. Well known in the oil and gas industries, Mr. Hugley is a graduate of Oklahoma A & M and has had extensive experience in the application of instruments in industry.

Chain Belt Co. Expands Atlanta Distr. Operation

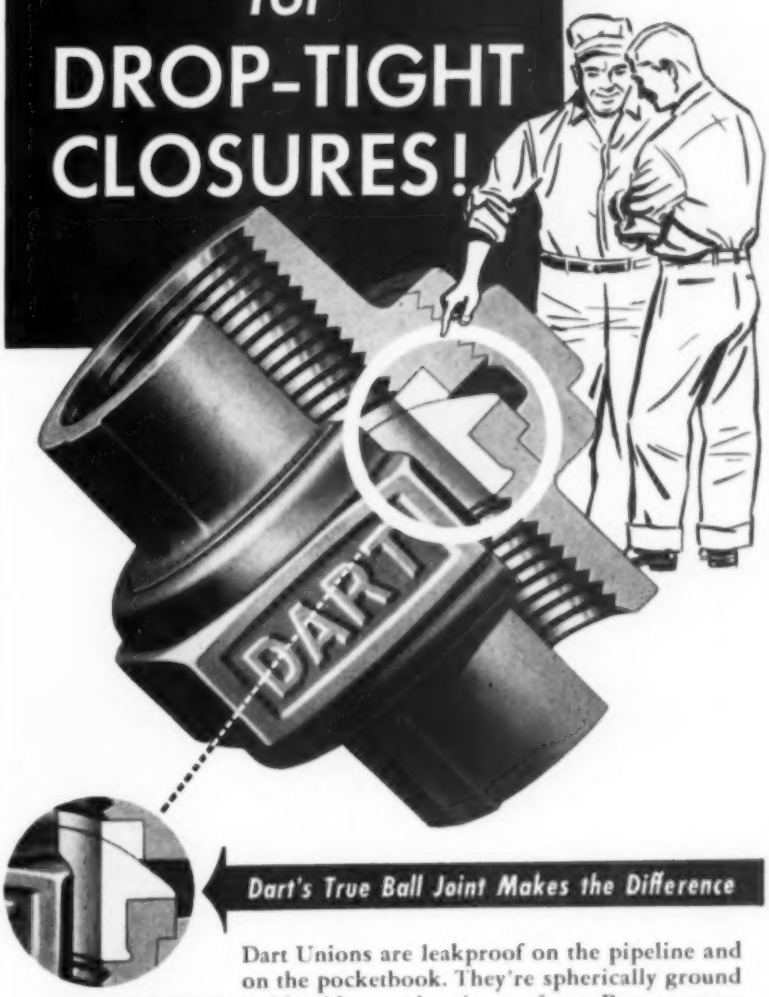
CHAIN BELT COMPANY of Milwaukee announces the appointment of DABNEY P. MURRILL to the engineering staff of the Atlanta District Sales office at 878 Ashby, N. W., Atlanta, Georgia. A M.E. graduate of Alabama Polytechnic Institute, Mr. Murrill was formerly a sales engineer of industrial equipment. He recently completed an intensive factory sales training course in the company's Milwaukee, Springfield, and Worcester plants.

Dabney P. Murrill has joined the Atlanta district sales office of the Chain Belt Company.

JIMMY MOORE is district manager of the Atlanta district sales office and warehouse; and R. RAY TRAYLOR is Sales Engineer. Chain Belt Company is one of the leading manufacturers of sprocket chains and power transmission machinery; conveyor and process equipment; and construction machinery.

Use 'em over and over again

for DROP-TIGHT CLOSURES!



Dart's True Ball Joint Makes the Difference

Dart Unions are leakproof on the pipeline and on the pocketbook. They're spherically ground to a true ball joint with wide, true-bearing surfaces. Because seats *stay* unscarred and true, these unions won't leak—and you can use them on job after job.

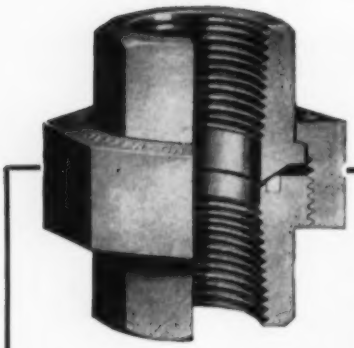
QUICK FACTS

- SEATS of special alloy bronze provide high resistance to pitting and corrosion
- BODIES AND NUTS are practically indestructible. They're air-refined, high test iron
- SHOULDERS are tough and heavy — made to take the most violent wrenching

Ask your supplier for Darts. You'll save money and leaks. And, if you do the installing job yourself, you'll save muscle and sweat also!

DART UNION COMPANY
Providence 5, Rhode Island
The Fairbanks Co. — Distributors
Boston·New York·Pittsburgh·Rome, Ga.

DART UNIONS



Ask Yourself these questions

before you buy

pipe unions again

1. Are the unions you're using designed having a truly spherical ball joint with brass seats recessed for protection and free-flow?
2. Do they have octagonal ends for easy tightening by any type wrench?
3. Are they *plainly marked* for 300# pressure?
4. Are they made of Air Furnace Malleable Iron with a tensile strength of 53,000 p.s.i. and air tested before shipment?

If you can't answer "Yes" to *all* these questions, you're not using

Jefferson UNIONS

. . . and you're not taking advantage of all these features which are back of Jefferson's reputation for high quality, maximum service and economy at a slightly higher cost.

Jefferson offers OWG 2000# to 2" and 1000# up to 4". The line includes AAR male and female unions, Enduro 300#, Excel 250# and Master 150# unions. All iron seats are also available in all types.

Contact your nearest distributor or us direct for your requirements.

•

JEFFERSON UNION CO.,

650 W. 26th St., New York 1, N. Y.
79 Gooding St., Lockport, N. Y.
49 Fletcher Ave., Lexington 73, Mass.

Webster Engineering Holds Engineering Conf.—Tulsa

WEBSTER ENGINEERING COMPANY, Tulsa, Oklahoma, held a two-day Engineering and Sales Conference in Tulsa, January 22 and 23. The conference featured talks and demonstrations by a number of well-known authorities in the fields of combustion and controls, and was attended by over 100 out-of-town representatives, agents and field engineers for Webster Engineering Company as well as representatives of regional gas companies.

L. S. REAGAN, Vice-President and General Manager of the Tulsa concern, had as his guest FRANK H. ADAMS, President of Webster Engineering Company and Surface Combustion Corporation. Adams addressed the meeting at its opening session.

A feature of the meeting was the introduction and demonstration of the Rotonetic, a new dual fuel burner developed by Webster for industrial and commercial boiler installations. This demonstration was conducted by GEORGE C. BERGTHOLDT, Chief Engineer and KURT S. JAEGER, Assistant Engineer of Webster.

Other sessions during the meeting included: Pressure Atomizing Oil Burners, conducted by John B. Westmont, Chief Engineer of the Wisconsin Burner Company; Horizontal Rotary Oil Burners, Fred Ravnsbeck, Chief Engineer of Staffco Engineering Company; Basic Combustion, L. S. Reagan, Vice President and General Manager of Webster Engineering Company; Webster Rectilinear Gas Burner Applications, George C. Bergtholdt, Chief Engineer of Webster Engineering Company; Barometric Draft Controls, E. A. Field, Chief Engineer of Field Control Division of H. D. Conkey and Company; Electric Motor Maintenance, Harold M. Furtney, Sales Engineer of Wagner Electric Corporation; and Design Engineering Progress in the Field and Combustion Safeguard Control Devices, John M. Wilson, Chief Electrical Engineer and Robert E. Heater, Assistant Chief Electrical Engineer of the Minneapolis - Honeywell Regulator Company.

The new Webster ROTONETIC Dual Fuel Burner for firing large heating or industrial boilers using either low pressure gas or any grade of fuel oil was introduced at The Webster Engineering Company's Annual Sales and Engineering Conference in Tulsa, January 22 and 23. Mrs. Bettye Riggs, Company secretary, demonstrates the ease of changing from one fuel to the other. Watching the demonstration is George C. Bergtholdt, chief engineer. The new unit will be manufactured in six sizes ranging in capacity from 75 to 300 boiler horsepower.

Rice Announces Two New Appointments

CYRUS WILLIAM RICE & COMPANY recently announced appointment of A. B. YOUNG, 1517 East 81st Street, Indianapolis, Indiana, as sales representative for Rice Services in the State of Indiana; and the NEVANS COMPANY (Thos. L. B. Webb), P. O. Box 20086, Houston, Texas, as Sales Representative for Rice Services in the states of Texas and Louisiana.

Parker Appliance Co. Jacksonville Distributor

The appointment of FLORIDA METALS, INC., Jacksonville, Florida, as a distributor of industrial tube fittings and tube fabricating tools has been announced by THE PARKER APPLIANCE COMPANY, Cleveland.

Florida Metals will maintain stocks of Parker fittings in a wide range of sizes at its Jacksonville headquarters, 2937 Strickland Street. This distributor has on call the services of Lewis C. Ely, Parker industrial sales engineer for the Atlanta territory. Florida Metals specialists will also be available for engineering assistance in the application of Parker products to hydraulic and other fluid-handling systems.

Eggelhof Engineers Expand—Southwest

EGGELHOF ENGINEERS, INC., has recently moved into new, enlarged offices at 4331 Belmont in Dallas. The move is part of a continuing expansion program at Eggelhof.

A. P. Woody

ALBERT P. WOODY has been appointed a consultant in steam generation, combustion and boiler process heating for Eggelhof Engineers in Houston. Mr. Woody formerly operated his own company, A. P. Woody Engineering Co., for six years. He was chief engineer of the F. J. Evans Engineering Co. for 10 years and served as a construction engineer for the New Orleans Public Service Gas Dept. for eight years. He has also served as a resident engineer on construction of the L. & N. Railroad and the Virginian Railroad. He is a native of Kentucky and attended the University of Kentucky.

Other branches of Eggelhof are located in Tulsa, Shreveport, New Orleans, Houston, Corpus Christi, San Antonio, Lubbock, Ft. Worth, and Little Rock.

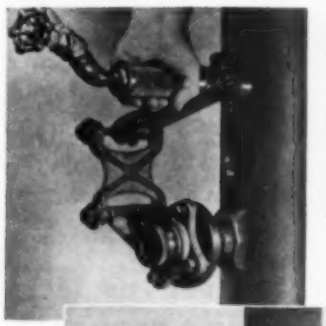
Westinghouse Creates St. Louis Branch

L. W. MCLEOD, vice-president in charge of the WESTINGHOUSE ELECTRIC CORPORATION'S SOUTHWESTERN DISTRICT, has announced the creation of a ST. LOUIS branch office. The office will function in addition to the present Southwestern District headquarters office, and will make possible better service to the Company's customers in the St. Louis area.

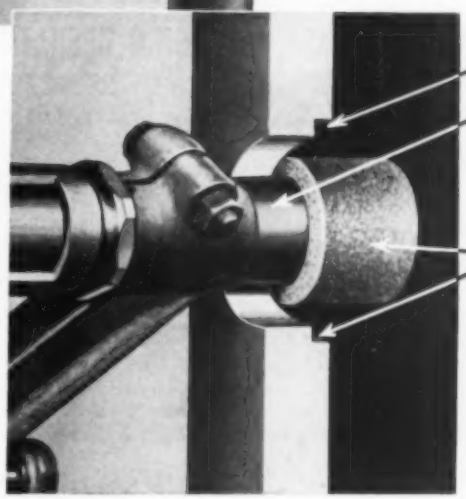
This and other Southwestern District changes are based on the successful pilot operation of the new organization pattern in the Central District. Headquartered in Pittsburgh, Pa., the Central District created a Pittsburgh branch office in 1952. The change will relieve Southwestern District staff managers of direct local supervisory duties.

E. S. REHAGEN was named St. Louis branch manager. A veteran of

Quick, easy and accurate job on refacing handhole seats with the



ELLIOTT HANDHOLE SEAT GRINDER


WIDTH OF SEAT
controlled by
GUIDE ROLLER
available in all sizes for seat widths from 3/16 in. to 21/32 in.
GRINDING WHEEL
acts as a surface grinder and is rigidly precision-controlled to move in a single plane which is the face of the seat, assuring positive flatness and a sure-tight seat.

Here is the modern time-saving and surely accurate way to reface handhole seats that have become corroded, scarred or wire-drawn. The grinding wheel of the Elliott handhole seat grinder is first inserted in the handhole to be refaced, then the base of the unit is clamped rigidly to the stud of an adjacent handhole, and leveled by adjusting the leveling screws. The plane of grinding, vertical to the axis of the hole, is fixed as to depth by the adjusting feed nut.

Setting up takes only a few minutes and the actual grinding only a few minutes more. Compare that to the labor and inevitable inaccuracy of hand filing or of a hand-held power grinder. Consider too, the certainty of *knowing* you have a tight seat, instead of the anxious testing and finding you haven't, when the pressure ultimately goes on.

Available with air drive, or electric motor as shown above. For details contact your local Elliott representative or write Elliott Company, Springfield, Ohio.

ELLIOTT Company

LAGONDA DIVISION

Y3-2

25 years with Westinghouse, Mr. Rehagen was graduated from the University of Missouri with a Bachelor of Science degree in engineering. He also was graduated from Rockhurst College at Kansas City, Mo., with a Bachelor of Arts degree in 1924. Mr. Rehagen comes to his new position from that of supervisor of the electric utility department.

Mr. Rehagen has appointed four sales supervisors to the branch office staff. They are Fred N. Wightman, Burl J. Snow, Edward B. Scruggs, and Ben H. Marshall.

In connection with the reorganization plan, branch office service and engineering managers and staffs were named. I. T. Monseth, Southwestern District engineering and service manager, appointed Roy D. Call as St. Louis branch service manager.

Vernon B. Wilfley was named engineering manager of the branch office. In addition to his responsibility as branch engineering manager, Mr. Wilfley was appointed district engineering manager, and will supervise the district consulting and application engineering staff.

RUGGED, LOW COST AIR CYLINDER WITH BUILT-IN VALVE SETS NEW STANDARDS FOR FAST, PRECISION OPERATIONS

Built-in electrical operating controls, built-in 4-way valve, built-in dual piston rod speed regulators, all with a single air connection, simplify installation of economical pneumatic circuits.

Any repetitive push, pull or lift movement now done manually can be performed infinitely faster, safer, and at lower cost with this unique, electrically-controlled Bellows Air Motor. The range of work it can do is limited only by the imagination of the tool designer or production engineer.

Unlike conventional air cylinders which require separate remote valves and cumbersome piping, the Bellows Air Motor is a complete power unit. It is compact, fits into crowded quarters, on moving machine elements. It is fast, responds to a starting impulse instantly. It is safe. Its low voltage operation simplifies wiring. It is sturdy, records of 10,000,000, 15,000,000, even 30,000,000 cycles without maintenance or repairs are commonplace.

The Bellows Air Motor is made in a wide range of mounting styles; in five bore sizes to meet varying power requirements; and in standard stroke lengths up to 48". For mechanical or manual operation the Air Motor can be equipped with a built-in manual valve, or for operation in explosive-hazardous areas with the built-in explosion-proof electrically controlled valve.

The Bellows Air Motor gives you an entirely new conception of the productive possibilities of air power. In the thousands of manufacturing plants where it is in use, it is establishing daily new records for cost reduction and improved productive efficiency. In textiles, in metal working, in plastics, in woodworking, in any industry you can name, these versatile power units are sparking the imagination of cost conscious production men looking for ways to do old and new jobs better.

Write For This FREE 36-Page Booklet

HERE IN THESE QUICK-READING PAGES IS THE STORY OF "CONTROLLED-AIR-POWER" — WHAT IT IS DOING FOR OTHERS — WHAT IT CAN DO FOR YOU. THERE IS NO COST, NO OBLIGATION. ADDRESS: DEPT. SPI 353, THE BELLOWS CO., BELLOWS BLDG., AKRON 9, OHIO. ASK FOR BULLETIN CL-50.

BELLOWS "CONTROLLED-AIR-POWER" DEVICES FOR FASTER, SAFER, BETTER PRODUCTION

6912A

The Bellows Co.
AKRON 9 OHIO

Stokes Joins James G. Nichols Co.

The JAMES G. NICHOLS COMPANY, Manufacturer's Agent for mechanical, instrumentation and chemical process equipment, has announced the appointment of JAMES S. STOKES, 3RD, of Atlanta, as an Associate, effective January 2, 1953.

James S. Stokes has joined James G. Nichols Company, sales engineers of Atlanta, Georgia

Mr. Stokes will specialize in chemical process equipment and instrumentation, having had more than 15 years experience in the field of Engineering. He attended the Hun School in Princeton, New Jersey and Rutgers University, before moving to Atlanta in 1949 from Ridgewood, New Jersey.

Mr. Stokes will work out of the Home Office, 84 Peachtree Street N. W., Atlanta, Georgia.

Lewis-Shepard Atlanta Headquarters

LEWIS-SHEPARD recently announced the appointment of A. L. SWICEGOOD as exclusive sales representative for the Atlanta territory. Mr. Swicegood has opened new sales and service headquarters at 1212 Spring Street N.W., Atlanta, Georgia, Telephone: Elgin 5856.

The new facility will be used entirely for the distribution and service of Lewis-Shepard industrial trucks. Demonstration equipment will be on hand together with a complete inventory of parts for immediate delivery to customers in the area. Service will be headed up by TOMMY GADDIS who has been appointed service manager.

Penflex Distributor New Orleans, La.

The PENNSYLVANIA FLEXIBLE METALLIC TUBING COMPANY, Philadelphia, Pa., has appointed as its distributor in the New Orleans territory the firm of MURRAY-BAKER-FREDERIC, INC., 626 S. Peters St., New Orleans 6, La.

Murray-Baker-Frederic will serve the territory covering New Orleans, Mobile, Baton Rouge, Jackson, and neighboring communities. They will handle the complete line of Penflex products, including Penflex interlocked galvanized steel and bronze hose, blower and ventilation hose, tar and asphalt hose, marine unloading hose, hose for gasoline pumps, tank wagon distillates and fuel oil, and Penflex-weld, with jointless, seep-proof walls, for the safe handling of modern high volatiles.

Nalco Expands Southeastern Staff

W. O. WIDENER, division manager, NATIONAL ALUMINATE CORPORATION, Box 145, St. Simons Island, Georgia, has announced the addition of W. T. SULLIVAN to the company's Southeastern engineering staff.

William T. Sullivan, Nalco's new Carolina-Virginia engineering representative.

Mr. Sullivan, a graduate of Indiana University, majored in bacteriology and chemistry. After a six month's Nalco training program, he was named representative in the Carolina-Virginia area with headquarters at 3101 Friendly Rd., Greensboro, N. C.

E. B. WELCH, formerly handling the Carolina-Virginia area, has moved to 516 10th Avenue N, Jacksonville Beach, Florida, and will represent Nalco in Florida and Southern Georgia.

R. E. TOWELL, 9 Old Hickory, Decatur, Georgia, represents Nalco in Georgia, lower Alabama and a portion of S. Carolina. Mr. Widener is division manager of the entire Southeastern engineering staff.

Hand Control Valve for cylinders . . . wall mounting . . . oil burner ignition system.

STARTING
OPERATING
OFF
ENCO OIL BURNING
3
2
1
Handle in off position. Electrodes and oil burner withdrawn.
Handle in operating position. Electrodes withdrawn and oil burner in firing position.
Handle in starting position. Electrodes and oil-burner in firing position.

3 Step

IGNITION SYSTEM

FOR PULVERIZED COAL, OIL, OR GAS

FAST SAFE POSITIVE

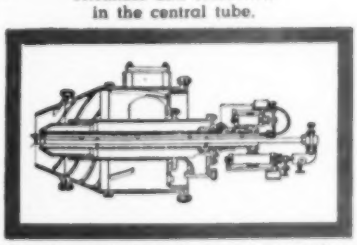
With an Enco Ignition System, operator can light off any burner by movement of a Hand Control Valve, located close to the pulverized-coal mill and fan controls, and within view of the instrument board. Automatically, a powerful ignition spark is established, and the light fuel turned on. Both are interlocked electrically — **the oil valve cannot be opened until the spark current is on and the atomizer is in firing position.** After the oil flame is established, a second movement of the control valve retracts the electrodes, leaving the atomizer in operation.

After ignition of the pulverized coal is established, a third movement of the control valve shuts off the oil and retracts the atomizer out of the hot zone, leaving the unit ready to repeat the operation as may be needed.

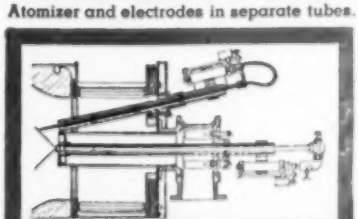
The Enco Ignition System has a wide range of application. Pulverized coal, blast furnace gas or any liquid fuel may be ignited by the unit, or the spark alone may be used to ignite natural or refinery gas. The ignition flame can be changed gradually from light to heavy fuel oil if continued operation under heavy load is required. The ignition flame also can be used as a substitute for principal fuel in emergencies.

Bulletin on request.

Atomizer and electrodes in the central tube.



Atomizer and electrodes in separate tubes.



THE ENGINEER COMPANY
75 West Street, New York 6, N. Y.

Enco OIL BURNING EQUIPMENT

Distributor for Allis-Chalmers Pumps

ROCHE & HULL, INC., 1107-19 Maryland Ave., Baltimore, Maryland, has been named a distributor for ALLIS-CHALMERS pumps in portions of Delaware, Maryland, Virginia, and West Virginia.

Territory covered by the firm includes Sussex and Kent counties in Delaware; all of Maryland except Allegany, Garrett, Montgomery, and Prince Georges counties; Shenandoah, Warren, Loudon, Clarke, Accomac, Northampton, and Frederick counties in Virginia, and Berkeley and Jefferson counties in West Virginia.

Roche & Hull was established in 1928 and is headed by George J. Roche.

U. S. Rubber Co., Atlanta

New assignments in the electrical wire and cable department of UNITED STATES RUBBER COMPANY were recently announced.

John Blake has been made manager of state and municipal sales, E. T. Corbus is manager of electrical utilities sales, and J. W. Loveland is now eastern division sales manager.

C. R. PICKENS will be the southeastern division sales manager, located at Atlanta, and H. J. Cluver will be the middle-Atlantic division sales manager at Philadelphia.

18,500,000 Dollars

The WESTINGHOUSE ELECTRIC CORPORATION has received orders valued at approximately $18,500,000 for electrical equipment to be used at Atomic Energy Commission installations in Oak Ridge, Tenn., and Paducah, Ky.

The largest group of orders, valued at $7,261,850 is for a number of unit substations using air-cooled transformers. This equipment is largely for use at the AEC project at Paducah. Another order valued at about $5,700,000 is for cubicle type switchgear, including circuit breakers, bus duct, and other necessary equipment for the AEC installation at Oak Ridge.

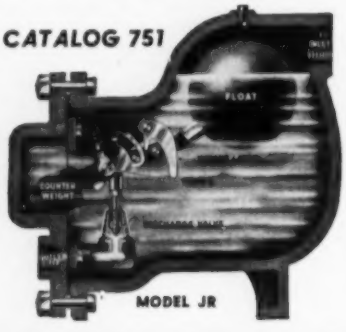
Another $2,853,000 order calls for a number of synchronous condensers at Oak Ridge and Paducah. To ship these 400,000-pound units completely assembled from East Pittsburgh, Westinghouse will utilize the world's largest railroad car, which has a drop-center bed 27 feet long, and which has 32 wheels. It was built by the Pennsylvania Railroad.

NICHOLSON W. O. TRAPS

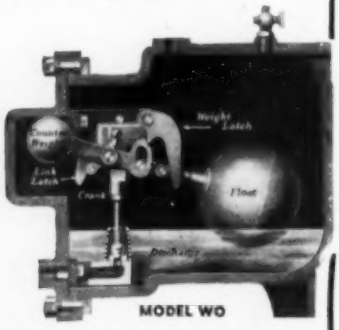
Cannot Leak Live Steam

Even though re-evaporation completely dries up its body, a Nicholson weight-operated trap will not leak live steam. These units do not depend on buoyancy of float to raise valve. Other features: large orifices keep valve clean; non-wire drawing; rugged for unavoidable abuse; not easily affected by dirt, pulsation; of stainless steel where it counts. Widely used for steam purifiers, super-heated steam lines, headers, separators, heaters, dry kilns, pipe coils, turbine throttle valve drips, stop and check valves, etc. Also for air and gasoline.

CATALOG 751



MODEL JR



MODEL WO

4 TYPES—press. to 200, 500, 650, 1500 lbs.; for every large-capacity, heavy-duty use.

175 Oregon St., Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.

TRAPS · VALVES · FLOATS

news (continued)

Harry M. Spring Establishes Consulting Engineering Firm

HARRY M. SPRING, JR., formerly Chief Inspector, Boiler and Pressure Vessel Division, Mutual Boiler and Machinery Insurance Company, announces a change after nearly nineteen years experience with the division.

Services as consulting engineer are being established with base at 280 Pleasant Street, Canton, Mass.

Mr. Spring will specialize in Steam plant problems, Design analysis Boilers and Pressure vessels, Radiography, Metallographic investigations, and Allied subjects.

Philadelphia Host to Materials Handling Show

Thousands of new models of materials handling equipment, valued at more than $10 million, will be displayed by exhibiting companies at the MATERIALS HANDLING EXPOSITION at Convention Hall, Philadelphia, May 18 to 22.

A test-check of some of the 255 companies which will demonstrate their machines revealed that hundreds of new developments will be shown for the first time at the show. It is expected to be the largest capital goods show to be held anywhere in the country during 1953 and will tax the tremendous capacity of all six halls of Philadelphia's huge auditorium.

Of major interest to visitors will be the stress this year on systems of materials handling. The use of various types of equipment to perform special functions will be emphasized.

Virtually every major factory has a materials handling engineering staff and no new plant is being constructed without consideration of the problems of handling. Most economists agree that the field of handling is the last great frontier for cost reduction. Despite the advances of recent years, it is still a fact that 25 per cent of all production payrolls is expended for no better purpose than picking things up, moving them, and putting them down again.

The exposition, which is being held in the East for the first time since 1949, is expected to attract more than 25,000 top management executives from all over the United States and from 40 foreign countries as well.

On display will be lift and fork trucks, both gasoline and battery powered, conveyors, both portable and

permanent, hoists, monorails, cranes, tractors, trailers, hand trucks, stacking units, portable elevators, skids and pallets, and their respective accessories.

The exposition has the sponsorship of the Material Handling Institute, an organization of equipment manufacturers. In addition to the show, a conference will be held under the sponsorship of the American Material Handling Society, composed of executives of companies which use mechanical handling systems.

Advance registration cards and hotel information may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

G.E. Air Conditioning Florida Distributor

The AIR CONDITIONING DIVISION of GENERAL ELECTRIC COMPANY has appointed MECHANICAL CONTRACTORS SUPPLY, INC., Winter Park, Florida, as its sole distributor covering the State of Florida and fourteen Georgia counties along the northern Florida boundary.

PAUL J. SPELLMAN, president of Mechanical Contractors Supply, Inc., has recently appointed GEORGE J. COLLINS as vice president and general sales manager, whose duties will be to enlarge the present dealer organization covering the Florida territory.

Industrial Trucks May Now Be Leased

A novel nationwide plan which permits users to lease industrial lift and fork trucks and allied equipment rather than buying them has been announced jointly by the Philadelphia Division of the YALE & TOWNE MANUFACTURING COMPANY, and C.I.T. Corporation, the industrial financing subsidiary of C.I.T. Financial Corporation.

The new plan enables factories, warehouses, railroads and others to obtain Yale materials handling equipment by paying monthly rentals as the machines are used. Under the program, the field sales organizations of Yale & Towne's materials handling division at Philadelphia will negotiate leasing agreements for Yale equipment with potential users. C.I.T. will then purchase the required equipment from Yale & Towne and lease it to the user for an agreed period of time. A corollary plan is also available for users who wish to purchase Yale materials handling equipment on installment terms rather than lease.

This NEW CONSTRUCTION Revolutionizes Swivel Casters!

LOCK-WELD

Built Stronger · Last Longer

Fairbanks'® great new swivel caster

LOCK-WELD CONSTRUCTION (patented) MEANS

NO KING PIN — completely eliminates the greatest single cause of caster failure: the king pin.

EASIER SWIVELING — double ball race held in rigid alignment. Tremendous increase in swiveling efficiency.

SUPER STRENGTH — top plate and retaining plate are projection welded into an integral unit. No wear between rigid and moving parts. Patented leg design prevents bending and buckling...disperses load over larger area.

COINED RACEWAYS · HARDENED BALL BEARINGS · PRESSURE LUBRICATION

Complete information on LOCK-WELD casters is contained in Bulletin 23-33, free on request.

THE **Fairbanks** COMPANY

393 LAFAYETTE STREET · NEW YORK 3, N. Y.

Branches:

New York 3 · Pittsburgh 25 · Boston 10 · Rome, Ga.

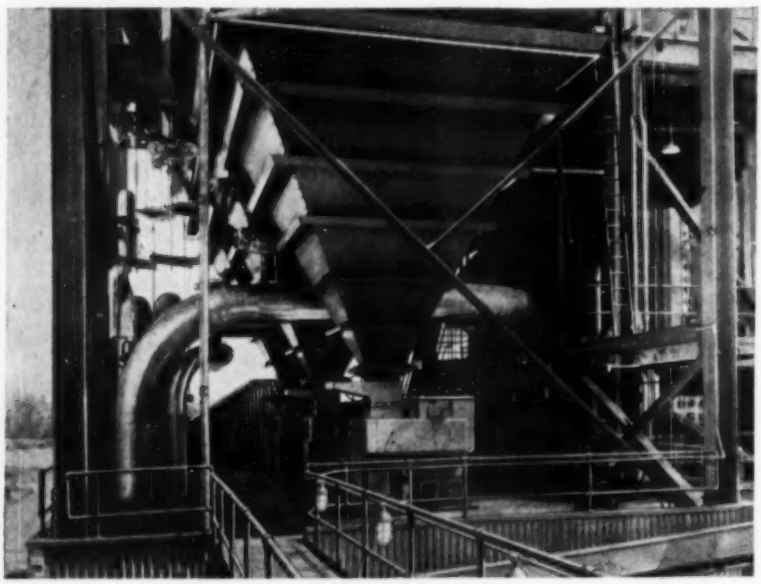
VALVES · DART & PIC UNIONS · TRUCKS · CASTERS

Carolina Power & Light

again specifies

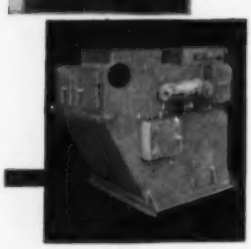
Richardson

Richardson Automatic Coal Scales are playing a vital part in helping supply power for the new Industrial South. Here are Richardson Model 39's in an outdoor installation at the new generating station of Carolina Power and Light.



To both industrial and utility power generating stations, specifying Richardson means—

1. A 24" x 24" inlet opening and 26" wide belt for maximum coal flowability.
2. All wiring and controls outside coal chamber.
3. Access doors which will not spill dust on floor when opened.
4. Beam ratio test facilities outside coal chamber.
5. Gravity operated by-pass, with no restriction of coal flow to downspout.
6. No drag links or wires attached to weigh hopper.
7. Nationwide after-delivery service.



Latest development in the 39 Series of Richardson Automatic Coal Scales is the Model H-39 shown above. May we send you our new 16-page engineering data book on the H-39 Coal Scale (Bulletin 0352), without cost or obligation?

RICHARDSON SCALE COMPANY · Clifton, New Jersey

Atlanta • Buffalo • Boston • Chicago • Detroit • Houston
Minneapolis • New York • Omaha • Philadelphia • Pittsburgh
San Francisco • Wichita • Montreal • Toronto

0751

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

Alco Products Division Regional Manager

The ALCO PRODUCTS DIVISION of AMERICAN LOCOMOTIVE COMPANY, serving the petroleum, chemical and power industries has announced appointment of A. T. LAWRANCE as regional manager in charge of sales located at Houston, Tulsa, Los Angeles, and Beaumont. These duties are in addition to his present assignment as plant manager of the Beaumont Iron Works, an Alco subsidiary.

Cambridge Wire Cloth Southern Sales Territory

The CAMBRIDGE WIRE CLOTH COMPANY, Cambridge, Maryland, has opened a new southern sales territory with headquarters at 333 Candler Building, Atlanta, Georgia.

MR. JAMES M. EVANS, formerly with Devoe Reynolds Paint Co., has joined the Cambridge sales staff to handle both sales and service work in the new territory from the Atlanta office. The southern territory includes the following states: North and South Carolina, Georgia, Florida, Alabama, Mississippi, and parts of Tennessee.

New Boiler Plant Wilmington, N. C.

The BABCOCK & WILCOX COMPANY has purchased a tract of land south of the city of WILMINGTON, N. C. and will start immediately to erect a new $2,000,000 plant to build boilers and related equipment.

This will be the second plant of the company to be located in Wilmington, and the fifth new plant to be added to the company's Boiler Division in a little over a year, making a total of seven plants in the division. The new plant will mean that the company more than doubled its productive capacity in the Boiler Division, in that the five new plants will be able to duplicate what the division could produce a year ago with its one large plant at Barberton, Ohio and a smaller plant at Alliance, Ohio.

The new plant will employ about 750 men when it gets into operation about the middle of June. The total area under roof will be about 135,000 square feet composed of three bays 500 feet by 90 feet. In addition, there will be 1500 feet of uncovered craneway. The plant will do such operations in the fabrication of large industrial boilers as bending tubes, building drums and headers, and assembling reheater sections.

any way you look at it...

Superwashed

COALS ARE BEST!

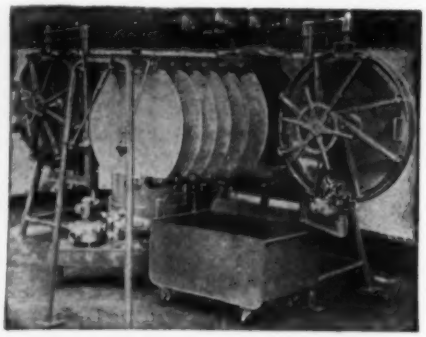
From any angle, Bell & Zoller's *Superwashed* ORIOLE coal is a top performer in keeping boiler efficiency up . . . steam costs down. Scientifically cleaned and correctly sized to meet your specific requirements—and shipped from the No. 11 seam in Western Kentucky via rail or economical combined rail-inland waterway routes.

BELL & ZOLLER COAL COMPANY

Bell Building • Chicago 1, Illinois

Zeigler • Oriole • Moss Hill • Murdock • Buckhorn
Spring Hill • Vesta Red Ash • Otter Creek

SIXTY-SEVEN YEARS OF SERVICE TO COAL USERS • ST. LOUIS • LOUISVILLE • OMAHA • MINNEAPOLIS • TERRE HAUTE



EMULSIFIED OR FREE OILS

Effectively Removed from Condensate with the

BLACKBURN-SMITH REFINER

OUTSTANDING ADVANTAGES

1. Breaks the tightest emulsion of oil in water
2. Reduces contamination to less than .1ppm.
3. Produces pure, clean condensate
4. Saves boiler tubes

Contaminated Condensate Formerly Wasted Can Now Be Re-Used After Filtration Through the Refiner

Proved in service . . . saves heat units and fresh water . . . no backwashing . . . reduces boiler maintenance costs . . . improves boiler efficiency . . . simple and inexpensive to operate . . . requires little space.

Write for catalog. Engineering assistance gladly furnished

THE BLACKBURN-SMITH MFG. CO., INC.

98 RIVER STREET, HOBOKEN, NEW JERSEY

Subsidiary of Condenser Service & Engr. Co., Inc.

HOBOKEN 3-4425 RECTOR 2-9360

BOILER TUBE CO. OF AMERICA

McKEES ROCKS, PA.

(Pittsburgh District)

PITTSBURGH • CHICAGO • FRED S. RENAULD & CO., LOS ANGELES

news (continued)

Tom A. Marsh Leaves Iron Fireman

IRON FIREMAN MFG. Co. has announced the resignation of T. A. (TOM) MARSH, national industrial engineer and manager of direct sales. Marsh, prominent in combustion engineering for many years, joined the Iron Fireman organization in 1934. Much of his work prior to 1940 was on the design of pneumatic spreader stokers, and he has been granted a number of patents on fuel-burning equipment and accessories. He will enter private practice in Cleveland as a consulting engineer in the combustion and smoke abatement fields.

During his career, he has delivered over 300 lectures to engineering groups throughout the United States. Author of two standard textbooks (*Combustion in the Power Plant and How to Buy, Sell, and Burn Coal*), Marsh has also written a wide variety of technical papers and articles for engineering societies and trade journals.

Air Reduction Expands Carbide Plant—Kentucky

The capacity of the new AIR REDUCTION calcium carbide plant at CALVERT CITY, KENTUCKY, is to be doubled. The additional capacity is expected to be available early in 1954. The original plant, which is nearing completion, has a rated capacity of 142,500 tons of calcium carbide per year.

Large quantities of calcium carbide will be shipped from Calvert City to Louisville, Ky., to supply acetylene to the Du Pont Company's neoprene plant in that city. These carbide shipments will supplement the production of Air Reduction's calcium carbide plant in Louisville.

At Calvert City, Air Reduction assembled approximately 1500 acres of land in order to make plant sites available for chemical manufacturers who wish to receive acetylene by pipeline. B. F. Goodrich Chemical Company, division of B. F. Goodrich Company, has located a plant on the site for the purpose of making vinyl chloride monomer. Negotations with other prospective customers are being carried on.

Both the Calvert City and Louisville plants are operated by National Carbide Company, a division of Air Reduction Company, Incorporated. This division also operates calcium carbide plants at Ivanhoe, Virginia, and Keokuk, Iowa.

WATCO

ROOF COOLING SYSTEMS can keep your workers at top efficiency through more comfortable summer working conditions.

● If you're interested in an efficient, simple and economical way of cooling your plant this summer, get information *now* on the WATCO method of roof cooling.

Here is a tried and proved way to lower inside temperature of your plant from 10° to 15° F., assuring far greater worker efficiency because of more comfortable conditions.

No large initial capital investment in air conditioning units is necessary. Maintenance and operating costs are exceedingly low. WATCO offers you a simple system of spraying your roof with water . . . waste water if available . . . that can be easily installed either by us or by your own plant maintenance men. Ask for the names of a few of the many representative industrial plants using the WATCO system.

● *For further information write for our Bulletin #20 and supplementary Bulletin #20A.*

WATCO WATER COOLING CORPORATION

ENGINEERS and CONTRACTORS

71 NASSAU STREET NEW YORK 38, N. Y.

G.E. Announces New Motor Service Plan

A new program to provide GENERAL ELECTRIC customers with prompt service on inoperative electric motors has been announced by W. D. LEE of the G-E Small and Medium Motor Department.

Called the Small Motor Service Station Plan, the program is expected to improve previous exchange plans by providing a more complete network of repair stations for G-E fractional horsepower and small integral horsepower motors, Mr. Lee said. In general, it was developed to better serve the requirements of original equipment manufacturers with a widespread system to which their customers and dealers can refer inoperative motors.

Under the plan, an authorized G-E Small Motor Service Station will provide in- and out-of warranty service on G-E motors, generators, and motor-generator sets of 1/20 to 15 hp and ¼ to 10 kw. The service will include general repairing, furnishing renewal parts, and exchanging motors for those that are inoperative.

Plans for the program call for the authorization and franchising of up to 180 key repair stations throughout the country. Each service station also will be offered a franchise as a distributor for G-E single-phase motors and motor renewal parts, he said.

The new plan is the result of the combined efforts of General Electric's Fractional Horsepower Motor, Small and Medium Motor, Agency and Distributor, and Service Engineering Departments. It is being introduced to prospective repair points with the aid of an operational kit containing explanatory and promotional material, and will be backed by G.E. with a direct mail campaign, tie-in space advertising, and other promotion.

Reprints . . . . SP&I Reader Service

BUSINESS . . TAXES . . GOVERNMENT

So much interest has been expressed in SP&I's "Better Government" series (see No. 4 starting on page 56), that we are offering reprints in limited numbers free to our readers in the South and Southwest. Reprints of the following are now available:

How Much Government Shall We Hire?, by Laurence F. Lee

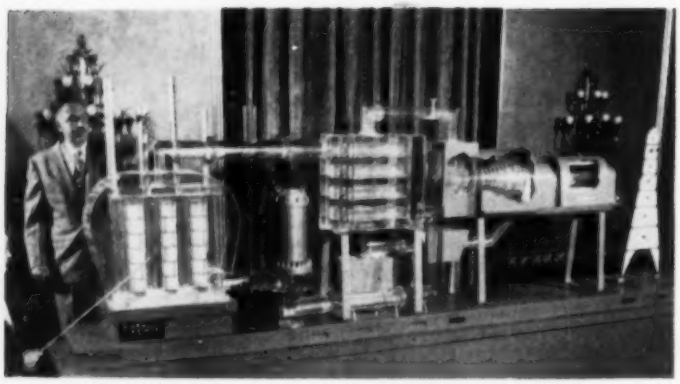
Freedom Demands a Solvent America, by Senator Harry F. Byrd

Opportunities for Tax Reductions, by John W. Hanes

Price of Survival in a Danger-Filled World, by A. Lee M. Wiggins

For your copies write:

The Editors: Southern Power & Industry
806 Peachtree St., N.E., Atlanta 5, Ga.



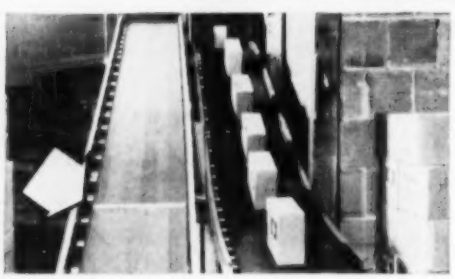
Plastic Model of Atomic Power Plant

THIS model of an atomic power plant was shown recently at the 57th Annual Congress of American Industry meeting. *Charles H. Weaver* (front left), manager of the Westinghouse Atomic Power Division, Pittsburgh, Pa., and *Dr. W. E. Shoupp* (rear), director of development, are studying the simulated nuclear reactor. Mr. Weaver is pointing to one of the rectangular columns used to represent the atomic pile; Dr. Shoupp is positioning one of the control rods.

The atomic pile generates heat through nuclear fission. To keep the pile cool, a suitable heat transfer liquid is pumped through the reactor to the rectangular boiler or heat exchanger and then back to the reactor again. Heat from the primary coolant is transferred to water in the secondary system in the boiler and steam results. This steam is used to drive the turbine-generator at the right.

ALLIGATOR

CONVEYOR BELT LACING



Every Tooth A Vise

in Long Continuous Lengths for Conveyor Belts . . .

★ Excellent for Package Conveyors, Portable Loaders, Trenching and Ditching Machines, etc.
★ In canneries where corrosion or rust is a problem specify Alligator made of Stainless or Monel.
★ For magnetic separators or anti-sparking specify Alligator made of Everdur.
★ Separable and smooth on both sides.
★ 12 sizes. For belts from 1/16" to 5/8" thick—and *any width.*

Order from Your Supply House. Ask for Bulletin A-60

FLEXIBLE STEEL LACING CO., 4678 Lexington St., Chicago 44, Ill.

JUST A HAMMER TO APPLY IT

G.E. Ad Manager for Southeast

JAMES L. TOWNSEND of Coral Gables, Fla., has been named manager of advertising and sales promotion of the GENERAL ELECTRIC COMPANY'S Southeastern Apparatus District. He will make his headquarters in Atlanta.

The district includes all of the states of South Carolina, Georgia, Florida, and Alabama; major portions of North Carolina, Tennessee, Mississippi and Louisiana; and a small part of Virginia.

Mr. Townsend, a native of Syracuse, N. Y. was graduated from Syracuse University in 1925 and joined G. E. that same year on the company's Test Course. He was assigned to fractional horsepower motor sales in 1926. He was appointed assistant manager of sales of the fractional horsepower motor section in 1942. Three years later he became manager of sales of the Fractional Horsepower Motor Division.

Mr. Townsend served with the company's Management Research Division for the first half of 1948, following which he was named assistant to the manager of sales of the G-E Commercial Refrigeration Division.

He was transferred to the company's Miami, Fla., office in 1949 as an apparatus sales engineer, and during the past year has acted as Florida representative of the G-E Agency and Distributor Division, working out of Miami and Jacksonville.

Houston Company Expands Sales Facilities

In an expansion and reorganization move, the second such expansion in two years, the PETRO-CHEMICAL EQUIPMENT CO., INC., announces its new warehouse and location at 6006 Harvey Wilson Drive, in the heart of Houston's industrial area.

The new location affords 6000 square feet of warehouse space, with truck-high loading docks on two sides and greatly enlarged handling and loading facilities; also three large offices.

H. C. (SCOTTY) SCOTT is president of the company, D. H. CORLETTE, vice president, and J. G. CHADICK, secretary and office manager. Other additions to the sales and office staff are MAYO DE'LONY, field engineer, and MRS. HELEN MANCE, office secretary.

The firm is manufacturers' representative and distributor for some of the oldest and best known old line companies, such as T. B. Wood's Sons Co.; Allis-Chalmers Mfg. Co.; W. A.

Jones Foundry & Machine Co.; Whitney Chain Co.; George P. Dorris Co.; and Imperial Metallic Lubricants. They are now prepared to carry the largest stock of power transmission equipment in the Southwest, Scott said.

Portable Demonstrator of GAI-Tronics Corporation

The GAI-TRONICS CORPORATION of Reading, Pa., specialists in the design and fabrication of effective communication systems for use in electric generating stations and industries where high noise levels make ordinary means of communication difficult and unsatisfactory, have already started on their 1953 series of demonstrations in the plants of several large utilities in Pennsylvania, Ohio and KENTUCKY.

This company, a subsidiary of Gilbert Associates, Inc., a foremost engineering firm, has developed a small edition of its system which makes possible a very realistic demonstration, under actual conditions in a prospect's plant. Actual performance of the system's features such as (1) the speed and sureness in locating plant personnel and/or giving instructions via special loudspeakers designed to effectively "cut through" high and difficult noise levels; (2) the ability to conduct two-way or group conversations over special telephone-type handsets, designed to work clearly and surely in extreme noise without the protection and operational undesirability of a sound-proof booth; and (3) the fact that the system is alerted for emergency use at all times, is effectively demonstrated under the most trying conditions.

Plans for the next series of demonstrations of the GAI-Tronics Power Plant Communication system are now being completed. Companies in several Southern states are listed in this series. Interested companies who have not made arrangements for a demonstration are urged to take advantage of the opportunity presented at this time, by contacting GAI-Tronics Corporation headquarters in Reading, Pa. A number of these systems have been installed in plants in the CAROLINAS, LOUISIANA, OKLAHOMA and TEXAS, where they are providing effective, dependable service.

GAI-Tronics Corporation is also engaged in the design and fabrication of special custom-built control equipment for use in electric generating stations and power plants.

These EVERLASTING advantages give better service from

Fig. 4001/6561. Duplex unit consisting of Straightway Lever-operated Valve and Angle Valve.

BOILER BLOW-OFF VALVES

When you install an EVERLASTING Duplex Blow-Off Unit, you'll find that its many superiorities speak for themselves.

The valve at the left is the EVERLASTING design that has been famous for more than 40 years . . . the valve with the drop-tight seal that actually improves with use because of its self-lapping action each time the valve is opened or closed . . . the valve that can't stick or jam because of its non-wedge design . . . the valve that opens in less than a quarter turn to provide unimpeded straight-through blow.

The valve at the right is the equally famous EVERLASTING Angle or "Y" Valve, specially designed and equipped to withstand repeated blowoff shocks, erosion and corrosion, and without pockets that might trap and hold solids.

Each of these valves . . . and all the other EVERLASTING Boiler Blow-Off valve types, fully meet ASME code requirements . . . assurance that they are properly designed and amply strong for the service.

Write for descriptive bulletin

EVERLASTING VALVE CO.
49 Fisk Street, Jersey City 5, N. J.

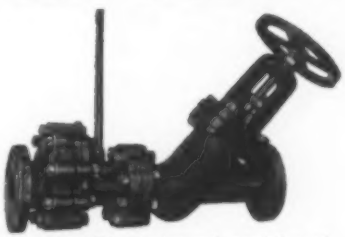


Fig. 4001/6571. Duplex unit consisting of Straightway Lever-operated Valve and Y Valve.

Fig. 6571/6561. Duplex unit consisting of Y Valve and Angle Valve.

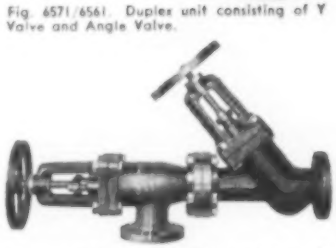


Fig. 6561/6571. Duplex unit consisting of Angle Valve and Y Valve.

Everlasting Valves

TRADE MARK "EVERLASTING" REG. U.S. PAT. OFF. EV-340

FOR EVERLASTING PROTECTION

MARTINDALE

COMMSTONE HOLDERS

Hold Commstones rigid and true for concentric resurfacing of commutators and slip rings while running at normal speeds in their own bearings. Interchangeable boxes 1", 2" and 3" wide handle grinding jobs up to 4¼" wide.

BLOWERS AND VACUUM CLEANERS

MARTINDALE COMMSTONES AND COMMUTATOR GRINDING TOOLS

MICA UNDERCUTTERS FOR SLOTTING COMMUTATORS

Nine Motor Driven Types

MARTINDALE PROTECTIVE MASKS

PLACE HEAD BAND WELL UP AROUND HEAD TO KEEP FROM SLIPPING DOWN
PRESS NOSE TABS IN CLOSE AGAINST FACE TO HOLD PAD AGAINST THE NOSTRILS
PRESS EDGES OF FACE PLATE DOWN TO FIT FACE SNUGLY

Weigh less than ½ ounce

Write for New 64-page Catalog No. 29 describing these and many other products for Industrial Maintenance, Safety and Production.

MARTINDALE ELECTRIC CO.

1334 Hird Ave. Cleveland 7, Ohio

news for the South and Southwest (continued)

Glidden Service Center Collinsville, Va.

Opening of a complete new industrial finishes service center and warehouse at Collinsville, Va., in the heart of the nation's major wood furniture producing area, was announced today by THE GLIDDEN COMPANY.

Featuring technical and color styling aid and a laboratory for the development and testing of special finishes, the new center will also provide warehousing facilities for Glidden customers throughout the important North Carolina-Virginia manufacturing region.

Located near the major producing areas, where 25 per cent of American wood furniture is made, the new industrial service center is designed to provide maximum service to Glidden customers by moving expert technicians and essential materials to the producer's front door.

Arrangements are also being made to provide similar prompt and efficient service from this center for metal fabricating manufacturers in the region.

The new Glidden installation will be staffed by men of broad experience in all phases of wood finishes and finishing. C. P. O'CONNELL and M. P. ROSKE will be the center's sales representatives, and L. V. WHITE will be in charge of customer service. Color styling and designing services will be performed by Glidden expert E. C. GREEN.

Texas Eastern Shreveport, Louisiana

H. M. MCDONALD has been appointed general superintendent for TEXAS EASTERN TRANSMISSION CORPORATION and PAUL L. HUGHEN has been promoted to pipeline superintendent.

McDonald was employed by Texas Eastern in 1947 and was elevated to pipeline superintendent in May 1948. He has served as acting general superintendent of the company since April 1952.

New Lighting Installation—Lockwood Greene

To eliminate individual desk lamps and to reduce shadows to a minimum, a new overhead fluorescent lighting installation provides 100 foot-candles of illumination on the drafting tables at Lockwood Greene Engineers, Inc., Spartanburg, S. C.

The uniqueness of the installation is the spacing of the six continuous rows of twelve CL-242 four-foot louver shielded Sylvania Electric fluorescent lighting fixtures. (One row contains only ten fixtures because of room stanchions.) Suspended one foot from the acoustical ceiling, 5 ft 2 in. above the working plane, the rows are lined up along each edge of the 6 ft drawing boards.

Where aisles and storage tables are placed, distance between rows is increased to 6 ft 9 in. High light reflection from the room's surface also adds to the satisfactory seeing conditions in this drafting room, with the acoustical tile ceiling providing a reflection factor of approximately 85 per cent and the green walls approximately 80 per cent.

Each fixture is equipped with two 40-watt Cool White lamps.

RIGHT AT THE SOURCE OF WASTE

For this 15 hp motor, power losses are corrected where it does the most good—*at the source*. A 4 kvar Sprague Power Factor Correction Capacitor across the terminals reduced reactive circuit current flow through transformers and wiring to a bare minimum . . . slashed power bills noticeably.

Sprague Unit-Cell Capacitors make it unnecessary to buy even one kvar more than you need. Write for the Sprague free guide of cost-saving suggestions, No. 50B.

SPRAGUE SPRAGUE ELECTRIC COMPANY
49 Marshall St., North Adams, Mass.
PIONEERS IN ELECTRIC AND ELECTRONIC DEVELOPMENT

LINDBERG

wherever metal is processed Lindberg equipment is used — or needed!

Here's a complete line of industrial furnaces, recognized for quality throughout the world: Cyclone Tempering Furnaces—Super Cyclone High Temperature Convection Furnaces—Atmosphere Heat Treating Furnaces—Atmosphere Brazing and Sintering Furnaces—Carbonitriding Furnaces — Atmosphere Generators — Melting Furnaces, Gas, Oil & Electric—Two-Chamber Induction Melting Furnaces—High Frequency Induction Heating Units.

For complete details on Lindberg equipment contact P. J. Duffy; Lindberg Engineering Company, 1170 Pine Ridge Road, N.E., Atlanta, Georgia, Phone: Cherokee 8014—or

LINDBERG ENGINEERING COMPANY
2450 W. Hubbard Street, Chicago 12, Ill.

HOW TO ROLL BOILER TUBES

You can count on smooth, efficient rolling action, which assures firm seating of the tube from precision-made Wilson Tube Expanders. They provide perfectly rolled joints, reduce time wasting re-rolling and re-inspection.

Wilson Model 38 Tube Expander— Popular, parallel, expansion flaring and rolling tool for high pressure boiler tubes, superheaters, economizers and marine steam generators. They do both rolling and flaring in a single operation . . . are available for tubes 1″ OD to 4½″ OD with various rolled lengths for tube sheets a half inch and up in thickness. Write for Bulletin 380A.

Wilson Accessories — Various boiler-maker accessories are in stock such as right angle worm drives, gear trains, extensions, universal joints in standard size squares, etc. Look to Wilson for a complete line of modern expander tools.

Wilson Tube Cleaners make short work of the toughest deposits. Driven by air, water, steam or electricity, these high speed tube cleaners can be furnished in straight or curved, ferrous or non-ferrous from ⅜″ to largest ever cleaned. Write for Bulletin 47A

Representatives in all principal cities
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Peerless Book Form
CARDS

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OF HEAVY FUEL OILS AND TARS
WITH
TYPE "SA" OIL BURNER

The popular NATIONAL AIROIL Steam Atomizing Oil Burner *thoroughly atomizes* and *completely burns* the lowest and cheapest grades of fuel oil or tar . . . requires minimum supervision and maintenance. Only slight oil pressure and temperature is needed . . . and internal atomizing venturi feature assures low steam consumption.

NATIONAL AIROIL Type "SA" Oil Burner is equally adaptable to all types of industrial heating, power or process furnaces . . . is suitable for firing above stoker grates on conversion to oil.

Write, on your business letterhead, for Bulletin 21.

NATIONAL AIROIL has a complete line of Oil and Gas Burners and Furnace Equipment to meet your every requirement.

NATIONAL AIROIL BURNER COMPANY, INC.
1279 E. SEDGLEY AVE., PHILADELPHIA 34, PA.
Southwestern Division: 2512 So. Blvd., Houston 6, Tex.

news for the South and Southwest *(continued)*

Allis-Chalmers Jacksonville, Florida, Branch

J. T. GRAHAM, a resident representative in the Jacksonville office of ALLIS-CHALMERS general machinery division since 1948, has been advanced to manager there. At the same time, it was announced by D. S. KERR, manager of the company's Southeast Region, that Jacksonville is now a branch office of the Tampa district.

J. T. Graham now manager of A-C, Jacksonville, Florida, branch.

Graham started with Allis-Chalmers in 1940 as a co-op student at the company's Pittsburgh Works. He received his electrical engineering degree from Georgia Tech in 1943 and after service in the U. S. Army Signal Corps returned to Allis-Chalmers in 1946. After completing the company's graduate training course, he was assigned to the Tampa district office in 1947.

Westinghouse Lamp Plant Manager—Fairmont, West Va.

GEORGE E. LAMBERT has been named manager of the WESTINGHOUSE LAMP DIVISION plant at Fairmont, W. Va.

Mr. Lambert, who has been administrative assistant at the division headquarters in Bloomfield, N. J., has been with Westinghouse since 1941. Before coming to Bloomfield, where he has been in control of division expenses and office methods, he was office manager in charge of accounting and order service at the Fairmont plant for four years.

Mr. Lambert is a graduate in business administration from the University of Pittsburgh. Before joining Westinghouse as a traveling auditor, he was with the Pittsburgh Construction Company as accountant.

TEMCO Expansion Dallas, Texas

Approval has been received from the Bureau of Aeronautics and the Bureau of Yards and Docks on the first three units of a building program which will expand the facilities available to TEMCO AIRCRAFT CORPORATION for production of the McDonnell F3H Demon and other aircraft.

The units approved at this time include a 58,000 square foot addition to the office building, which will more than double office space now available; a 30,000 square foot paint hangar, and a 7,500 square foot paint stripping building. Total cost of the three units is expected to run in the neighborhood of $2,200,000.

New Representatives for Pennsylvania Crusher

The PENNSYLVANIA CRUSHER COMPANY, 1700 Liberty Trust Bldg., Philadelphia 7, Penna., announces the appointment of MINE AND SMELTER SUPPLY CO., El Paso, Texas, as representative in New Mexico, Arizona and Western Texas.

The ALLIGER AND SEARS COMPANY, 2203 Fannin Street, Houston, Texas, will represent the company in Central and Eastern Texas and Southern Louisiana; and the Tampa Armature Works, Inc., 401 S. Morgan Street, Tampa 1, Florida, will be representative in Florida and Southern Georgia.

Cleco Distributors Nashville, San Antonio and Waco

The CLECO DIVISION of the REED ROLLER BIT COMPANY, Houston, Texas, has announced the appointment of NIXON MACHINERY COMPANY, 1211 Demonbreun Street, Nashville 4, Tennessee; SWING MACHINERY AND EQUIPMENT CO., 110 Pendleton Avenue, San Antonio 5, Texas; and SAN ANTONIO MACHINE & SUPPLY CO., P. O. Box 148, Waco, Texas, as distributors for Cleco products in their areas.

Cleco manufactures the Cleco and Dallett lines of air tools and accessories—including tools for construction, manufacturing, metal fabrication, foundries, industrial maintenance and stone carving.

WHAT'S NEW and Where to Get It

Free literature on the latest developments in equipment and supplies is offered by leading manufacturers. For your copy, circle the item number on one of the reader service post cards provided on pages 17 and 18.

B-10 **ELECTRICAL CONNECTORS**—Catalog, 8 pages—New line of electrical splicing connectors, terminal lugs, rubber and Neoprene insulating sleeves, and crimping tools under the name of "Insul-Lock." Feature of line is a light weight mechanical type portable hand crimping tool, which crimps wire and cable without application of heat. Chart gives pictures and specifications for selection of proper tool for each job.—F. M. ANTHONY CO., 2022 Oakland Ave., Piedmont 11, Calif.

B-11 **MATERIALS HANDLING**—File Folder, "Engineered Applications"—Illustrated set of case studies featuring MonoRail materials handling applications in all types of industry. Track, cranes, and auxiliary equipment are included.—THE AMERICAN MONORAIL COMPANY, 13107 Athens Ave., Cleveland 7, Ohio.

B-12 **PAINT MILDEW CONTROL**—Bulletin, 16 pages—"Paint Mildew and Its Control" contains sections on the nature of paint mildew, the fungi that cause it, methods of studying them, proper formulation to combat mildew, and properties of the company's new paint fungicide.—NUODEX PRODUCTS CO., INC., Elizabeth, N. J.

B-13 **HYDRAULIC OIL CYLINDERS**—Bulletin No. FM-1, 4 pages—Illustrates and describes heavy duty, simplified design, hydraulic oil cylinders designed especially for use in 2000 psi hydraulic systems. Table shows dimensions for cylinder mountings.—FISHBURNE MACHINE COMPANY, P. O. Box 6006, Asheville, N. C.

B-14 **INDUSTRIAL LIGHTING**—Bulletin No. 8, 8 pages—Describes the "revolution in industrial lighting," based on concept of balanced brightness, as well as sufficient light, over the entire work area. Discusses lighting fixtures, and benefits of good plant lighting. Illustrated with plant photographs.—GENERAL ELECTRIC COMPANY, Lamp Division, Nela Park, Cleveland 12, Ohio.

B-15 **ROOF INSULATION**—Folder, 8½ x 11 in.—Opens to a large sheet that has more than 40 photographs of installations of Fiberglas roof insulation in industrial plants and other operations. Includes data on thermal conductance and application specifications. — OWENS - CORNING FIBERGLAS CORPORATION, Toledo 1, Ohio.

B-16 **SEWAGE PUMPS**—Bulletin No. 7600, 4 pages—Illustrates and describes vertical sewage pumps, float controls, alarms, and starters. Specifications and table of approximate dimensions in inches are included, with line drawing and equipment photographs.—THE DEMING COMPANY, Salem, Ohio.

B-17 **CENTRIFUGAL PUMPS**—Bulletin 524M, 2 pages—Illustrates and describes the Model 4M "fly-weight" centrifugal pump, 1½ in. size, 4000 gph, designed for heavy duty service in a variety of industrial uses. Discusses automatic priming, built-in suction check valve, bellows-type cartridge shaft seal, direct line flow, non-clogging impeller, and other design features. —RICE PUMP & MACHINE COMPANY, Grafton, Wis.

B-18 **ION EXCHANGERS**—Bulletin No. 3803, 28 pages—Covers demineralization including silica removal by ion exchange. Describes applications, principles of operation, design features, advantages,recommendations and specifications of the apparatus and synthetic resins. Illustrated. —THE PERMUTIT COMPANY, 330 West 42nd St., New York 36, N. Y.

B-19 **INDUSTRIAL SEPARATOR**—Bulletin, "The Sweco Separator," 8 pages—Discusses design, operation, and applications of the separator in industrial plants. Line drawings show engineering details, and plant photographs are included.—SEPARATOR DIVISION, Southwestern Engineering Co., 4800 Santa Fe Ave., Los Angeles 58, Calif.

B-20 **VERTICAL TRANSPORTATION**—1953 General Catalog, 24 pages—Describes complete line of Otis equipment and services, including passenger elevators, dumbwaiters, freight elevators, elevator modernization and maintenance programs. Illustrated with photographs and line drawings. Tables provide dimensions and engineering data.—OTIS ELEVATOR COMPANY, 260 Eleventh Ave., New York 1, N. Y.

B-21 **WIRE THREAD INSERTS**—Bulletin 660, 8 pages—Explains use of stainless steel wire thread inserts in tapped holes; discusses design, production, marketing and maintenance advantages by this method of thread protection in internal combustion engines, heavy assemblies such as industrial furnaces, and houses of impact tools. Illustrated.—HELI-COIL CORPORATION, 1303 Shelter Rock Lane, Danbury, Conn.

B-22 **SPIRAL CONVEYORS**—Catalog 851, 24 pages—Gives specifications and information for ordering spiral conveyors of different types for use in various industrial applications. Equipment is illustrated, line drawings give engineering data, and specific plant applicational photographs are included.—THE JEFFREY MANUFACTURING COMPANY, Columbus 16, Ohio.

B-23 **CONTROL PANELS**—Bulletin No. 170, 8 pages—Discusses engineering and economical planning of modern combustion and process control panels. Numerous control panel designs are illustrated, along with up-to-date methods of tubing and wiring. Includes section on panel accessories.—BAILEY METER COMPANY, 1050 Ivanhoe Road, Cleveland 10, Ohio.

B-24 **INDUSTRIAL PUMPS**—Bulletin 52, 4 pages—Contains details and specifications of models from the 2 in., 7,000 gph size, to the 4 in., 40,000 gph portable, self-priming centrifugal pumps. Design improvements are discussed. Illustrated with equipment photographs and line drawings.—RICE PUMP & MACHINE COMPANY, Grafton, Wis.

B-25 **SPEED REDUCTION UNITS**—Catalog, 20 pages—Illustrates and describes shaft-mounted speed reduction units. Gives information on dimensions of units, application, installation, and instructions on how to select correct size unit for a given application. — THE AMERICAN PULLEY CO., 4200 Wissahickon Ave., Philadelphia 29, Pa.

B-26 **BOILER-BURNER UNITS**—A.I.A. File No. 34-B-1, 14 pages—Prepared to aid architects and engineers in selection of proper unit for any particular application to high or low pressure heating, power or process steam. Tables give ratings, engineering data, and dimensions. Illustrated.—KEWANEE-ROSS CORPORATION, Kewanee, Ill.

B-27 **BOILER REFRACTORY**—Bulletin 44, 8 pages—Illustrates and describes a new refractory for boilers, made of "Thintile" tile construction for water wall backing and boiler baffles. Diagrams show installation and construction details, and table gives physical characteristics.—LACLEDE—CHRISTY COMPANY, Arcade Bldg., 812 Olive St., St. Louis 1, Mo.

B-28 **DEAERATING HEATER**—Bulletin WC-110, 4 pages—Describes a spray-tray type packaged deaerating heater for the smaller steam generating plants. Discusses design, construction, operation and installation. Includes plant photographs.—GRAVER WATER CONDITIONING CO., Dept. 13-9, 216 West 14th St., New York 11, N. Y.

CARECO ONE-PIECE FURNACE LINING
Reg U.S. TRADE MARK Pat. Off.
For REPAIRING or LINING
A PLASTIC LINING USED IN PLACE OF FIRE BRICK

LONGER LASTING BOILER FURNACES

Boiler furnaces lined with CARECO last two to four times longer than those lined with fire brick. Write for quotation.

CAROLINA REFRACTORIES COMPANY
HARTSVILLE, S. C.

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(Basic Principles of Steam Plant Practice)
By A. D. HOLLAND
Assoc. Prof. of Mech. Engr., Georgia School of Technology

"Fundamentals of Boiler Plant Engineering"—is different from most handbooks in that it goes into the fundamental principles of boiler plant operation. It is written so that it can be studied by those who have not had an opportunity to learn these basic laws; at the same time its many charts, tables and formulae make it a valuable reference book for the trained engineer.

The basic principles covered in this book have such wide application that it will be extremely helpful to refrigeration, air conditioning, textile and hydraulic engineers and master mechanics. Stiff cover, cloth binding, 4½ x 7 inches, 232 pages, 37 tables, 55 illustrations, 30 memorandum pages for your special notations. "FUNDAMENTALS OF BOILER PLANT ENGINEERING" may be secured with a 3-year subscription to SOUTHERN POWER & INDUSTRY for $3.00.

Take advantage of this special offer while it lasts. Write today to

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built to your specifications

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Send us your specifications for prompt quotation
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THE ELECTRIC SERVICE CO., INC.
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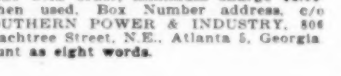
NEW RILEY-JONES HYDRAULIC STOKER

In original crates. 150 HP. 150% rating. Complete, priced for quick disposal. P. O. Box 7026, Nashville, Tenn.

GAGE GLASSES AND
High Pressure Rubber Gaskets
ALL SIZES TO FIT YOUR WATER GAGES



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Send for Catalog LIVINGSTON, N. J.

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Engineer, 25 years experience in a supervisory capacity, over operations, maintenance and engineering in the following departments—Steam Electric Power, Electrical, Mechanical Production, Control and Instrumentation. Now employed, but considering making a change. Available on 30 days notice. Write Box 202, care of SOUTHERN POWER & INDUSTRY, 806 Peachtree St., N.E., Atlanta 5, Ga.

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Graduate Mechanical Engineer—30 years, married. Licensed Engineer. Experienced in steam, gas and electric power. Seeks position with small firm of sales or consulting engineers. Write Box 203, care SOUTHERN POWER & INDUSTRY, 806 Peachtree St. N.E., Atlanta 5, Ga.

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INDUSTRIAL RELATIONS

Asst. director. Experienced with: employment; job training programs; organized labor. $450-$600.

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Large, well established, successful organization in combination manufacturing distributing field in the Southeast wants experienced executive to work up to General Manager, at adequate present and future returns,—to be top man in perhaps ten years. Prefers engineering graduate under 40, with some executive experience, preferably in handling a good grade of employees, with some knowledge of wage incentives and employee relations. Must have personality, ability, and interest in public relations, to ultimately assume top position in community and business life. Address Box 204, care SOUTHERN POWER & INDUSTRY, 806 Peachtree St., N.E., Atlanta 5, Ga., giving complete details. All information held in confidence.

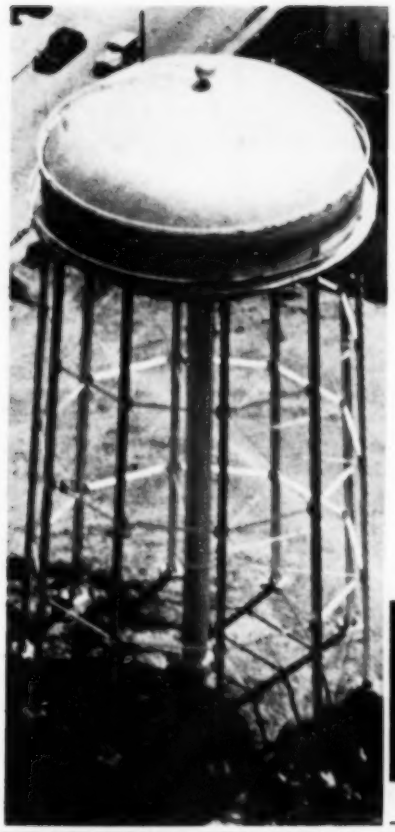
YOUR ADVERTISEMENT ON THIS PAGE

HAVE you some equipment, new or second hand, which you wish to dispose of? Do you desire a good man to fill a vacancy in your plant? Do you desire a position? Do you desire your business or professional card placed before the power, industrial and refrigeration fields?

Why not try an advertisement on this page of SOUTHERN POWER & INDUSTRY with its 16,000 copies per month? SOUTHERN POWER & INDUSTRY reaches the active executives and managers, superintendents, heads of departments and engineers—the men directly in charge of plant process, the men who buy or dictate the buying of machinery, equipment and supplies.

Advertising on this page produces results at small cost. Note the rates above and tell us what you wish to advertise.

SOUTHERN POWER & INDUSTRY
806 PEACHTREE ST., N.E. ATLANTA 5, GEORGIA



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Write for latest catalog — "Tank Talk."

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TOWERS • BINS • STANDPIPES

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STEAMFITTERS & BOILERMAKERS QUALIFIED WELDING for:

Carbon Steel Pipe and Chrome-Moly Alloy Steel Pipe for High Temperature and High Pressure.

Our products are designed and built to comply with the requirements of the ASME Code and we are authorized to apply the appropriate Code Symbols.

Let Us Solve Your Code Welding Problems!

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BOILER REPAIRS & SUPPLIES

PEERLESS BOILER & ENGINEERING CO.

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During the past 7 years, hundreds of plants have discovered that SIPCO "Dunking Stations" are the "all time" solution to their plant smoking problems.

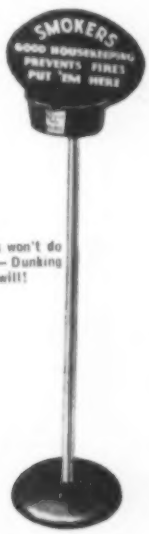
Built for hard industrial use—and abuse! Cigarets, cigars, matches extinguished immediately—no smoldering—no fire hazard.

Unit No. 1—Heavy cast aluminum canister, attractive metal sign, upright and heavy weighted base for use on floors, aisles, etc.

Unit No. 2—Same as Unit #1, except without upright and base. Easily mounted on walls, columns and posts.

Unit No. 3 (Not illustrated)—Canister alone, with mounting brackets.

Send ***TODAY*** *for new illustrated folder which gives complete details.*



Makeshifts won't do the job — Dunking Stations will!

STANDARD INDUSTRIAL PRODUCTS CO.

Dept. F — 116 South Garfield Ave., Peoria, Ill.

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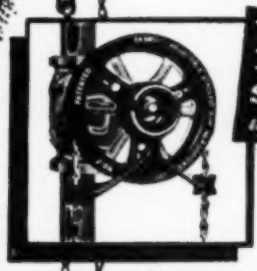

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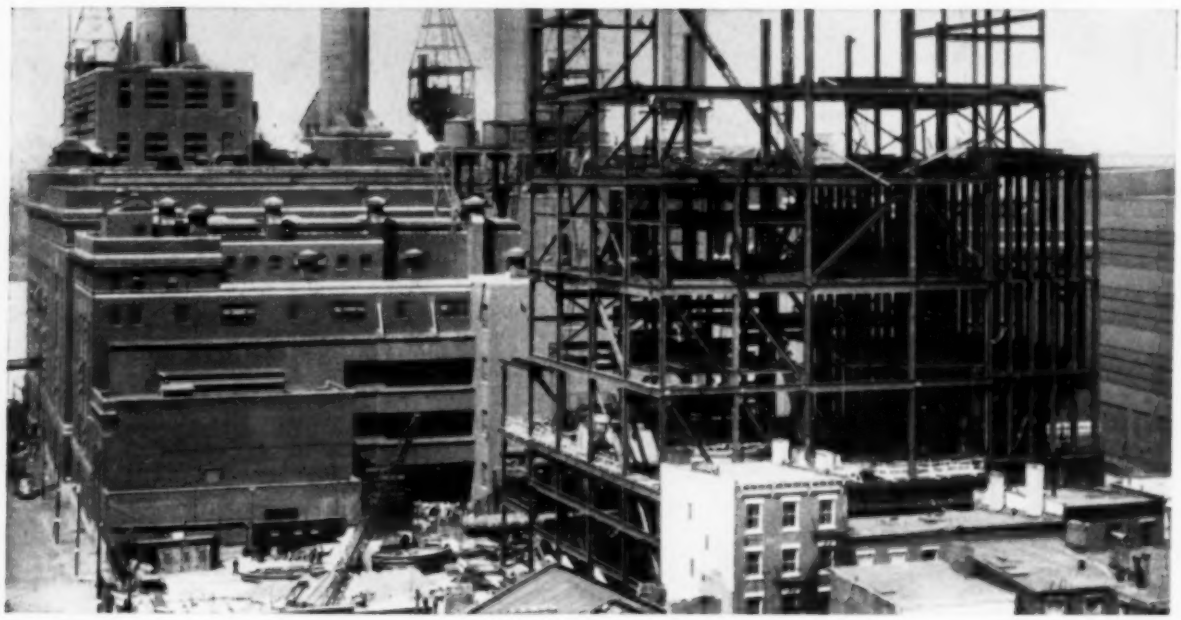

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